Can the Americans Compete?

(page 13)

International Management Digest®

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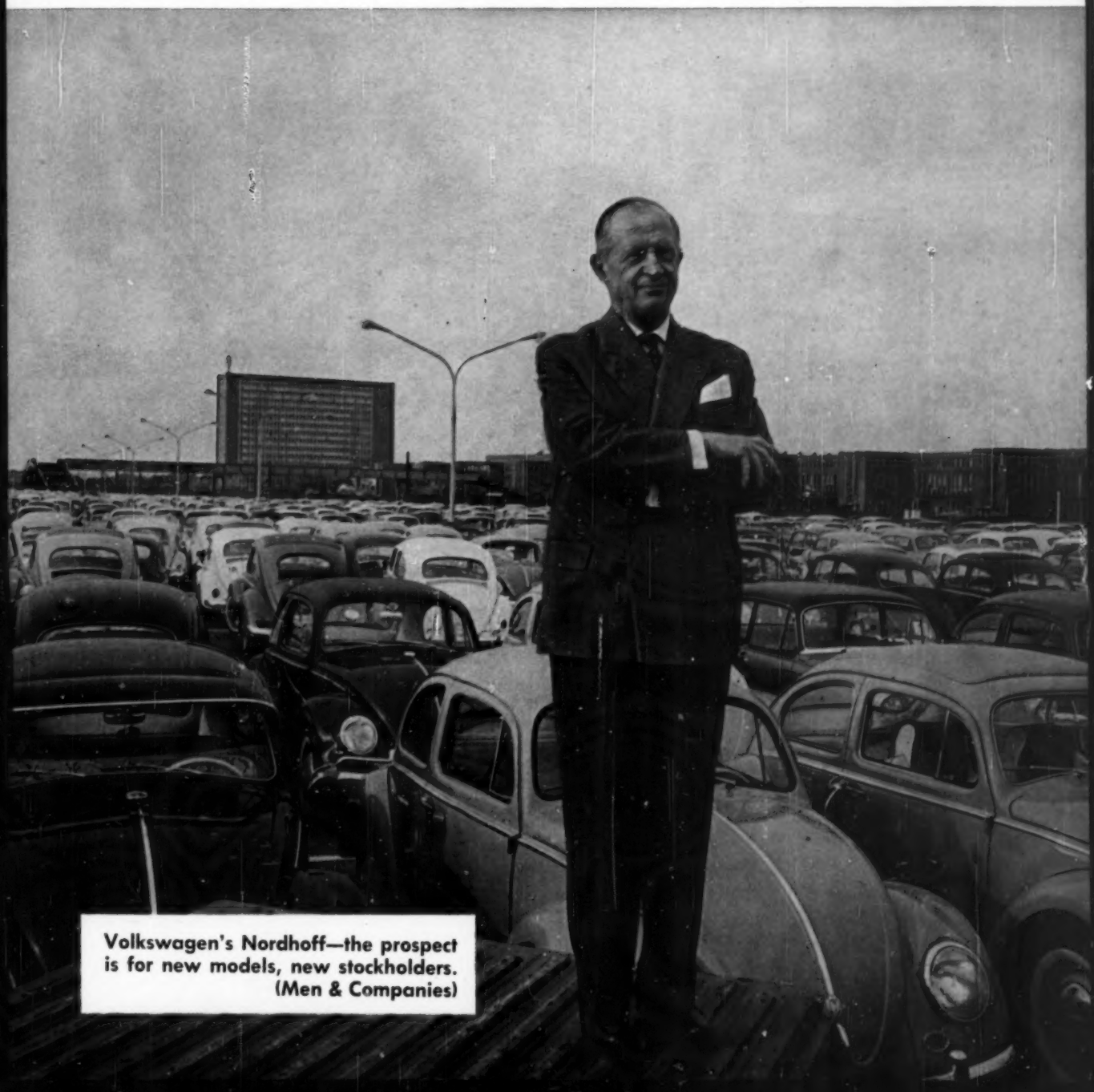

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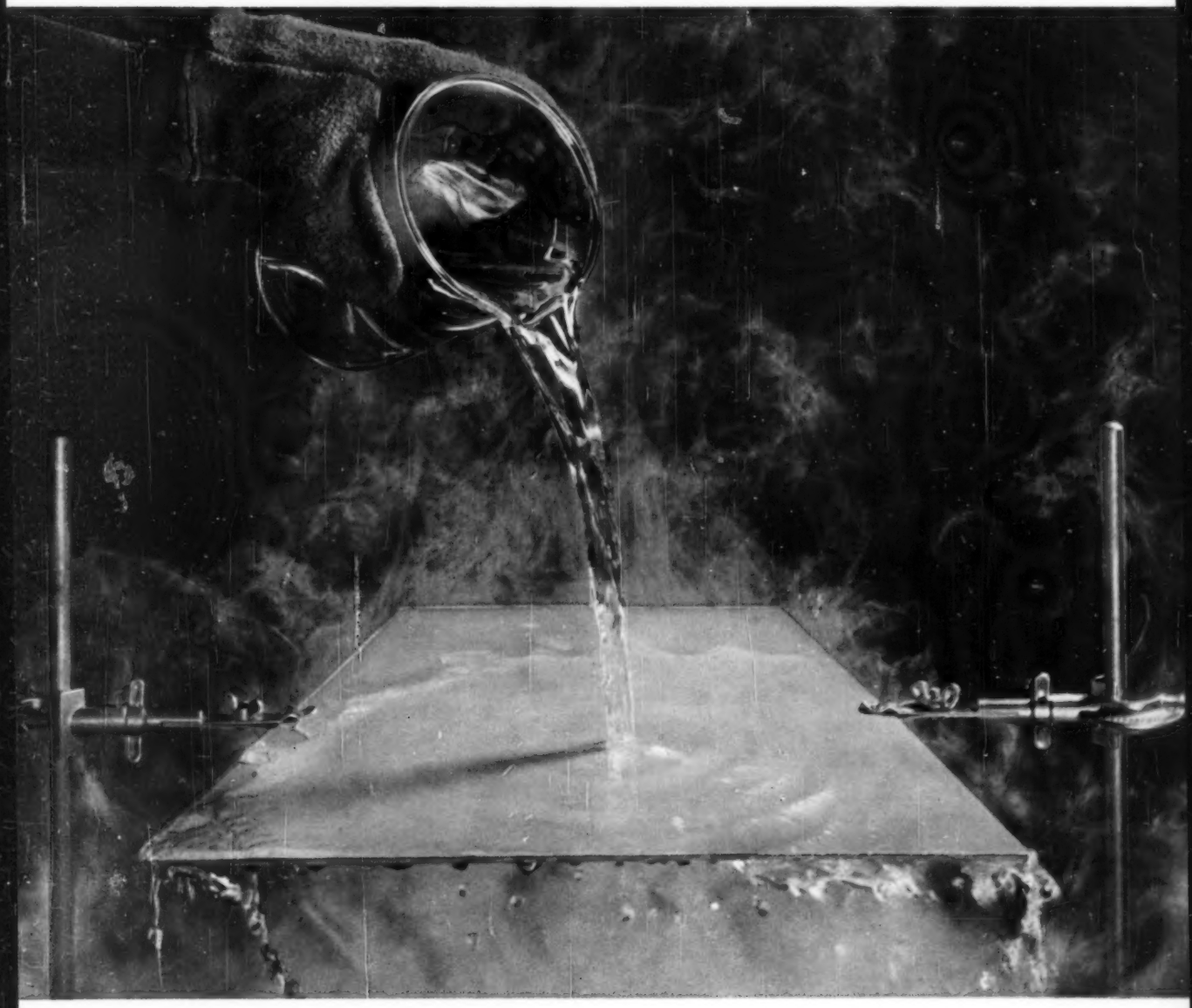

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American Letter

Dear Sir: February, 1960

YOU CAN DISCOUNT FEARS OF A PROTECTIONIST SURGE IN THE U.S.A. THIS YEAR. True, there is a presidential election, and that means seekers of tariff and quota protection will redouble their efforts. Also, public concern about import competition is rising. Yet at this reading, the chances are good that Washington's policy of keeping trade barriers as low as possible will stand.

Here is why: U.S. business is good, and that takes some of the economic punch from the protectionist case. Secondly, the government places high priority on next autumn's tariff negotiations with its trading partners. The Geneva sessions may go far toward setting rates at which U.S. goods will move into important markets--notably Europe's "Six" and "Seven". So Washington is anxious to keep its bargaining position free of a protectionist taint. Finally, the U.S. government is preparing a new effort to promote exports (IMD--Oct.,p 1).

Washington believes that a substantial rise in exports, rather than curbs on imports, is the best long-range solution to its international payments deficit. The program taking shape would include government export credit guarantees and insurance, better commercial representation abroad, a campaign at home to encourage more aggressive exporting--possibly with some exemptions from antimonopoly laws for exporter associations. It is hoped that this package will help to head off the 1960 drive by the protectionists.

But do not be surprised if liberal trade gives way to political pressure in several isolated instances. Lead and zinc is one, particularly if mining-state Senators succeed in their effort to have Congress, rather than the President, decide on tariff matters. Certain steel products and some textile goods might win more protection. On the other hand, protectionist efforts for fluorspar, turbines and generators, transistors--among others--have little chance of success.

* * * *

LOOK FOR HIGHER INTEREST RATES IN MOST MAJOR WORLD MONEY MARKETS. The increase stems from greater demands for credit combined with governments' determination to resist inflation. Though tighter money should not greatly impede trade, it will make credit considerably more expensive--by 25%, perhaps 50%.

Rates in New York, which have been higher than any other center but Toronto, will continue upward. But the rate of increase will be steeper in Europe. Thus the gap between U.S. interest rates and those in markets like London and Frankfurt will begin to narrow as Europe's business boom gathers momentum.

Higher rates help strengthen the international position of the dollar, for the short run at least. Foreign investors, seeking fatter yields, will want dollars. But there is a long-run threat, for greater foreign investment in the U.S. means an additional obligation in terms of gold. Thus the U.S. must keep its rates at a high enough level to prevent a big shift abroad when foreign rates rise.

(continued next page)

American Letter

THIS SITUATION POSES SOME DANGER OF AN INTEREST RATE "WAR". It happened in the 1920s when one country after another raised rates to lure foreign deposits and halt the gold outflow. Fortunately, central bankers of leading nations are today seeking to keep peace and prevent artificial rate rises. They are cooperating more than ever before, and are not likely to make big shifts in their governments' holdings of foreign currencies unless severely provoked.

A cautionary note: Watch private funds, the holdings of "hot" or "smart" money, flexible and quick to react to even small rate changes. For if massive movements of private funds occur, central bankers might decide to act.

* * * *

THE CULT OF EQUITY STOCKS SPREADS ROUND THE WORLD. As prices advanced almost without interruption in major markets last year, common shares have become the favorite of conservative individuals as well as speculators, of mutual funds (unit trusts) and other "institutional" investors, attracting buyers ranging from the staid Church of England to housewives. Says a Frankfurt broker: "What the German investor does not know about stocks, he makes up for in enthusiasm."

More and more, the emphasis is on capital gains rather than yield--the American principle of "growth stocks". In many markets, yields on quality stocks have dropped to 3% or less--look at prices in Zurich, Melbourne, Toronto, Frankfurt, New York. In contrast, many good bonds yield 5%, or more.

Can the surging interest in equities hold up under a test of fire? Most markets have not yet had a real "shaking-out" after constant price rises. But one exception is Tokyo. In the final days of 1959, a lot of small investors rushed to the market with year-end bonuses--and were burned by the second sharpest one-day price drop since the war. Their enthusiasm dwindled considerably.

A MORE CAUTIOUS ATTITUDE TOWARD STOCKS SEEMS INDICATED FOR 1960. This in spite of good business, and the prospect that share prices may move even higher. But most observers question how long the rise can be sustained. Share prices are rapidly discounting future increases in earnings, and future inflation as well. In January, The Economist of London warned that British equity prices "will depend on the growth of earnings over a much longer period than most shareholders have been prepared to contemplate."

What to do? Keep a close eye on U.S. stock prices. Though international ties are less than they used to be, few markets are totally immune from the influence of Wall Street. And, warns Business Week, "some very real strains may develop that will pull the U.S. market down." A signal to watch is the yield on high-grade corporate bonds: If it goes to, say, 6%, bonds could become almost irresistible to important owners of equities.

The final word on equities is selectivity. Professional investors constantly emphasize individual issues, not "the market" generally. They expect even wider variations in the performance of individual company shares in 1960.

(The 1960 Outlook, country-by-country--concluded)

PORTUGAL: Little change is expected during 1960. But Portugal has much to gain from membership in the "Outer Seven" and will be ardently wooed as European countries seek closer commercial ties this year.

SOUTH AFRICA: Downturn in the economy has been halted and expansion is the watchword for 1960. Business' inventory investment will pick up. Consumer income may climb as result of the drive to increase the wages of unskilled native labor. Thanks to a $200-million balance of payments surplus last year, import permits will be liberalized. But tariffs will rise.

SPAIN: The nation's new status as a full member of the Organization for European Economic Cooperation, as well as bilateral trade treaties with France and West Germany, augur well for 1960. Trade with Britain is also growing and this trend will continue. Last year's devaluation checked inflation--for the present.

SWEDEN: Main difficulty in 1960 will be keeping rising wages and growing Government spending from unleashing internal inflation. Labor troubles are certain as the proposed 4% turnover tax on most goods has stimulated unions to demand a 6% increase. Timber and steel exports rose sharply in 1959, but cannot count on such an increase in 1960. Imports will climb as inventories are depleted. Gross national product will advance 4% this year.

SWITZERLAND: Dark spot in the current record business is Switzerland's future relations with Common Market and Outer Seven countries. Although the Swiss played a leading role in setting up the Outer-Seven group, they stand much to lose if integration of the two trading areas--which is their goal--does not quickly materialize. Meanwhile, Swiss production capacity is expanding steadily.

THAILAND: 1960 will be one of the best years in Thai history. Rice, rubber, tin shipments are expected to exceed 1959.

TURKEY: Business activity will get needed stimulus from the recent $144-million deal with three U.S. firms to build a steel mill. Turkey will be shopping for heavy equipment, furnaces, coke ovens and building materials.

UNITED ARAB REPUBLIC: Expect an increased volume of trade with West. More interest by Western firms in Egyptian enterprises also is due. Imbalance of imports over exports will be accentuated by heavy loan repayments to Soviet bloc.

NEW PRODUCTS: A new impact extrusion press may make two-piece aluminum containers more competitive with tin cans. Its output is double the rate of existing machinery. For details: E.W. Bliss Co., New York, New York.

A stroboscopic revolution-counter ("Touro-Strob") can determine speed and amplitude of motion as well as number of revolutions of many machines. It is package-size, portable. Mayer & Co. KG, Neheim-Husten 2, West Germany.

A tiny, all-transistorized television set will be marketed in March by Sony Corp., (Tokyo, Japan). It has a 20 cm. screen, weighs just over 5 kg., operates on batteries or house-current.

UNITED KINGDOM: "A Year of Challenge" is how London regards 1960. Number one question is whether Britain can maintain present upward curve without running into inflation, balance of payments problems, and weakening pound. If wages and prices can be kept in line (and the outlook is hopeful), then pound will remain strong. Industrial output should rise about 5% compared with last year's 10% when country was climbing out of mild recession. Although the general picture is bright, there are dark spots in shipbuilding, coal, and aircraft industries.

URUGUAY: Elimination of multiple exchange rate system lays the groundwork for some improvement in a stagnant economy. But it will take time to recover from last year's crop failures and trade deficit.

U.S.S.R.: Trade with non-Communist lands will rise. Soviets have a big shopping list for Western suppliers, especially chemical and electronic equipment. Also, aid to underdeveloped nations is high on Soviet "must" list.

VENEZUELA: A gradual broadening of controls and reforms can be expected amid an atmosphere of better business. Expect protection measures, such as recent extension of restrictions on most luxury imports. Bolivar will not be devalued.

* * * *

A QUICK REVIEW OF EXCHANGE, CREDIT, AND BUSINESS CONDITIONS

Country	Exchange Rate (units per $1, New York)			Government Reserves (gold & foreign exchange, millions)		Dollars in U.S. Banks	Conversion Delays / Collection Experience		Business Conditions
	5 Jan. 1960		2 Dec. 1959	latest month	year ago	(Millions)			
Argentina	82.50	Peso	82.00	$ 221.0	$ 177.0	$ 291.0	3 Mos.	Fair-Good	Improving
Australia	• 2.23	Pound	• 2.23	1,157.0	1,120.0	123.0	none	Very Good	Good
Austria	25.65	Schilling	25.65	699.0	669.0	392.0	none	Good	Good
Belgium	50.00	Franc	50.25	1,334.0	1,391.0	125.0	none	Very Good	Improving
Bolivia	12,000.00	Boliviano	12,000.00	8.4	6.6	22.9	4 Mos.	Poor-Fair	Poor
Brazil	190.00	Cruzeiro	195.00	450.0	511.0	150.0	3 Mos.	Good	Fair
Canada	.9546	Dollar	.9524	1,871.0	1,895.0	2,253.0	none	Very Good	Improving
Chile	1.05	Escudo	+1,100.00	105.2	67.0	141.0	2 Mos.	Good	Improving
Colombia	7.01	Peso	6.90	179.0	179.0	200.0	2 Mos.	Good	Improving
Costa Rica	6.67	Colon	6.67	16.6	22.9	24.5	1 Mo.	Good	Improving
Cuba	1.25	Peso	1.25	294.0	429.0	191.0	3 Mos.	Poor-Fair	Deteriorating
Denmark	6.80	Krone	6.80	282.0	219.3	109.6	none	Very Good	Good
Dom. Rep.	1.00	Peso	1.00	40.7	42.0	39.1	none	Good	Improving
Ecuador	16.67	Sucre	16.67	40.7	35.3	17.4	1 Mo.	Fair-Good	Improving
El Salvador	2.50	Colon	2.50	37.9	38.8	22.4	1 Mo.	Fair-Good	Improving
Finland	335.00	Markka	351.00	317.0	281.5	78.7	none	Good	Improving
France	4.95	Franc	492.50	1,793.0	1,200.0	1,095.0	none	Good	Good
Germany	4.17	D-Mark	4.1750	5,608.0	6,019.0	1,521.0	none	Very Good	Very Good
Greece	29.41	Drachma	29.41	202.8	198.0	171.7	1 Mo.	Fair-Good	Improving
Guatemala	1.01	Quetzal	1.01	39.7	48.8	35.5	1 Mo.	Good	Fair
Honduras	2.00	Lempira	2.00	15.8	8.7	6.3	1 Mo.	Good	Fair
India	6.25	Rupee	6.25	676.0	690.0	122.0	1 Mo.	Good	Fair-Good
Indonesia	200.00	Rupiah	200.00	276.0	232.0	116.0	3 Mos.	# L/C Basis	Deteriorating
Iran	76.92	Rial	76.92	198.0	251.0	21.0	3 Mos.	Fair-Good	Fair-Good
Iraq	• 2.70	Dinar	• 2.70	302.4	337.0	18.0	2 Mos.	# L/C Basis	Fair
Israel	2.50	Pound	2.50	121.2	104.1	80.4	1 Mo.	# L/C Basis	Good
Italy	621.00	Lira	621.00	3,116.0	2,429.0	1,535.0	none	Very Good	Good
Japan	392.00	Yen	392.00	1,105.0	939.0	1,169.0	1 Mo.	Good	Good
Mexico	12.35	Peso	12.35	398.0	402.0	396.0	none	Good	Good
Netherlands	3.77	Guilder	3.77	1,350.0	1,425.0	426.0	none	Very Good	Good
New Zealand	• 2.63	Pound	• 2.63	248.0	187.0	7.0	none	Very Good	Good
Nicaragua	8.00	Cordoba	8.00	10.9	14.6	11.3	none	Very Good	Good
Norway	7.14	Krone	7.14	242.4	226.1	100.9	none	Very Good	Improving
Pakistan	6.67	Rupee	6.67	189.0	157.0	6.0	2 Mos.	# Fair-Good	Improving
Panama	1.00	Balboa	1.00	45.7	42.4	150.1	none	Very Good	Improving
Peru	27.77	Sol	27.40	55.4	30.4	95.7	1 Mo.	Good	Improving
Philippines	3.57	Peso	3.57	89.0	75.0	176.0	1 Mo.	# Fair	Fair
Portugal	28.17	Escudo	28.17	813.0	736.0	142.0	1 Mo.	Good	Fair-Good
South Africa	• 2.76	Pound	• 2.76	406.0	329.0	48.0	none	Very Good	Good
Spain	60.40	Peseta	60.40	54.0	57.0	71.0	none	# L/C Basis	Improving
Sweden	5.17	Krona	5.17	439.0	476.0	241.0	none	Very Good	Good
Switzerland	4.33	Franc	4.34	1,909.0	2,096.0	891.0	none	Very Good	Very Good
Turkey	12.50	Pound	12.50	266.0	322.0	28.0	12 Mos.	# Poor	Fair
U. A. R.	• 2.00	Pound	• 2.00	400.0	432.0	17.0	3 Mos.	# L/C Basis	Poor-Fair
U. K.	• 2.80	Pound	• 2.7980	2,735.6	3,156.0	874.0	none	Very Good	Good
Uruguay	• 10.81	Peso	• 11.11	180.0	180.0	70.0	none	# Fair	Improving
Venezuela	3.34	Bolivar	3.34	894.0	1,151.0	254.0	1 Mo.	Good	Fair-Good

*U.S. Dollars per Pound #Most Exports by Letter of Credit +Peso †Nouveau franc

The Editors

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● THE READERS' PAGE

Acknowledgment

Sir . . . I must confess I could have hardly anticipated the worldwide response which has been "triggered" by the article regarding Ultragaz in INTERNATIONAL MANAGEMENT DIGEST of September. I have received written congratulations from friends in Cuba, Venezuela, Europe, and Australia as well as innumerable local phone-calls, congratulatory messages, etc.

My conscience dictates that I properly question whether we, or more specifically I, deserve this special and unusual recognition. I would like to believe that it reflects the results of our company's and my own efforts which emphasize, first and always, customer interests and dependable service. . . .

You will no doubt be interested in the fact that the congratulatory response in this case covers the full range of commercial firms, large and small, as well as friends, customers, and suppliers. This certainly would indicate sincere appreciation of our past efforts—which we proudly acknowledge.

Pery Igel

Cia. Ultragaz
Sao Paulo, Brazil

Hope for Hula Hoops

Sir . . . In your December "Predictions of Things to Come" you said: "The man who can find a market for unused plastic Hula Hoops will make a great deal of money." Here is an idea:

Buy 10 showers and install them in your house. Then take 10 Hula Hoops, tie them to the showers with specially-made SIEMS Hula-Hoop bindings and cover them with SIEMS Hula-Hoop plastic. You now have 10 separate bathrooms, which you rent to people. Anyone taking a cold bath under a SIEMS shower must pay me 5¢; a warm bath, 10¢. All world rights reserved!

Gotfred Siems

Copenhagen, Denmark

Wrong Reactor

Sir . . . On page 11 of your July issue, which I recently had the opportunity to read, you have a photograph showing the reactor house of a nuclear power station which is being completed in this country. The photograph is of Reactor I at Berkley Nuclear Power Station which is the most advanced of the phase I stations being completed, and is being constructed by the AEI—John Thompson Nuclear Engineering Co. Ltd. But your caption to this photograph names it "Britain's Hunterston" station.

As your journal is widely read, I feel it is necessary for me to point out to you your error, as the progress which it depicts is accurate with regard to Berkeley but definitely not so with regard to Hunterston.

D. H. Edson

John Thompson Ltd.
Wolverhampton, England

No Apology Needed

Sir . . . I had the pleasure of reading a recent copy of your most interesting magazine, and was so impressed with it that I took the liberty of quoting two passages in the speech which I gave as chairman of the Australian Foundation Investment Company. The speech was printed and circulated among our stockholders and others.

Subsequently my attention was directed to your prohibition of reproduction of any of the contents without written permission. I therefore hasten to assure you that this breach on my part was occasioned not by disregard but by ignorance of this restrictive condition.

Staniforth Ricketson

Melbourne, Australia

● We were delighted with Mr. Ricketson's "breach" and have assured him that the copyright provision in no way applies to such short quotations and reprints. It was, by the way, an admirable speech!—EDITOR

Applause

Sir . . . That American Letter is a wonderful new feature. . . . I have always found INTERNATIONAL MANAGEMENT DIGEST valuable. But with the new Letter I consider it five times as valuable. Many congratulations. . . .

Richard M. Boesen

Lima, Peru

Sir . . . For many years I have been an interested reader . . . and I find the expansion of IMD an excellent idea.

S. W. Flood

Oslo, Norway

Sir . . . More than ever do I feel the necessity of a reliable and intelligent news service, and the INTERNATIONAL MANAGEMENT DIGEST especially deals with the most acute problems of my profession of management.

Antonio Diaz

Maracaibo, Venezuela

Sir . . . I welcome the news of the merger of American Letter and INTERNATIONAL MANAGEMENT DIGEST. . . .

R. Bar

The Hague, Holland

Sir . . . I am glad to find the American Letter incorporated into IMD. . . . While the American Letter reports on the economic trend, IMD roams over the wide and luscious fields of business activities, probing and digesting a variety of information and presents them in a very readable form.

James P. Conway

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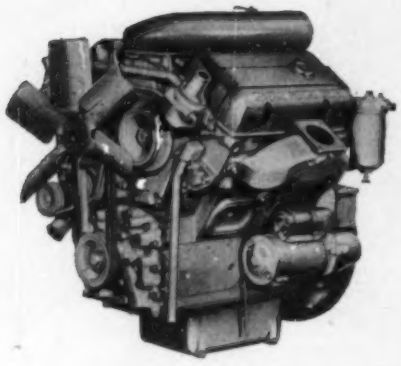

Series 53

Years of General Motors research and diesel experience have combined to produce this latest model series, engineered to world-proven GM two-cycle advanced design. Compact, lightweight, these Series 53 Diesels are available in 2-, 3-, and 4-cylinder in-line units, and a space-saving 6-cylinder "V" unit. Power range: 20 to 190 HP. Their superior design enables the Series 53 to attain horsepower ratings comparable to heavier, bulkier diesels—and to do so with lower fuel input. Ideal for industrial and automotive applications and economy leaders in any engine conversion program.

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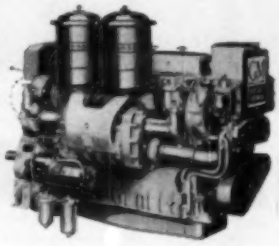
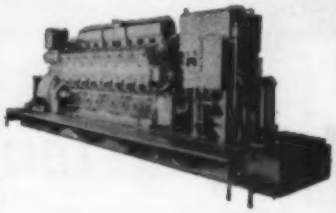
If you are looking for a diesel engine that weighs less... takes less space... costs less to maintain... and does more work using less fuel, then take a look at other outstanding members of the GM Diesel family. Part of the most complete diesel power line any engine manufacturer ever designed and produced, they provide in-line and "V" engines—for stationary or portable power—covering a horsepower range from 20 HP to 2800 HP. Parts and service are available through the worldwide GM organization. No wonder GM is the *preferred* diesel for over 1800 different applications of power equipment built by more than 175 manufacturers.

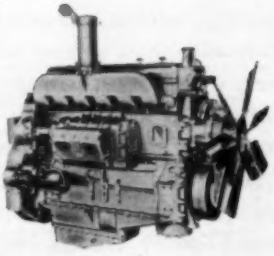
SERIES 71 Available in single 2-, 3-, 4- and 6-cylinder units, plus "twin" and "quad" 4's and 6's, with in-line and "V" cylinder configuration. Turbocharged, also, in 4- and 6-cylinder versions. A ruggedly built diesel engine with interchangeable, low-cost parts. Power range: 45 to 875 Rated Brake HP. Widely used for marine applications, buses, trucks, electric power generation, drilling and construction equipment.



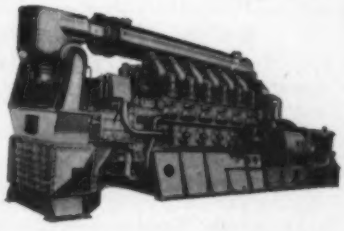
SERIES 567C A rugged 2-cycle V-type Diesel available in 8-, 12- or 16-cylinder units. Single unit power range: 720 to 1750 HP. Compact, lightweight, with low operating and maintenance costs. A practical and dependable unit for power generation or peaking service (up to 1000 KW). This series also provides a dependable power unit for the main propulsion systems of inland waterway, coastal and ocean going vessels.



SERIES 110 Available as 6-cylinder unit or Tandem Twin engine... turbocharged or non-turbocharged... delivering up to 600 Rated Brake HP. Has new side-mounted blower... is shorter, lower, more compact than ever. Economical operation—costs less to buy, less to operate, less to maintain. Applications include: Marine, Industrial, Construction, Electric Power Generation, Petroleum Drilling and Service Operations.



SERIES 498 TURBO-POWER A new GM development for large marine, and electric power generating applications, these 2-cycle turbocharged engines provide 75% more horsepower per cylinder, less weight and volume per horsepower, improved fuel economy, higher thermal efficiency. Available in 8-, 12- and 16-cylinder units, in single or multiple drive arrangements. Single unit power range: 1400-2800 BHP.



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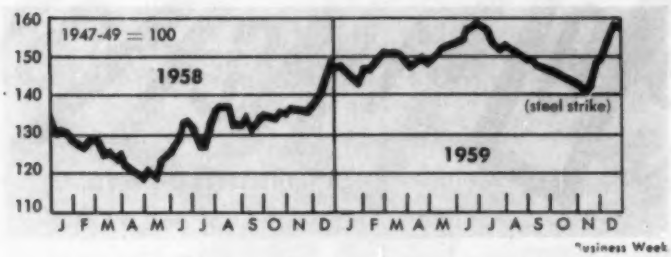
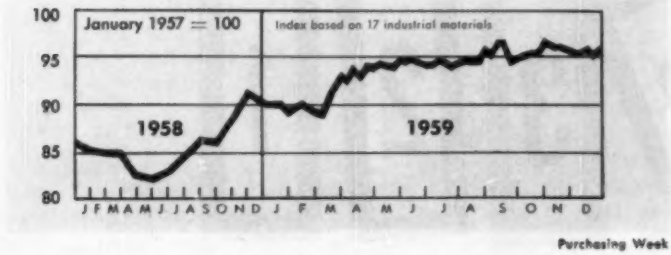
Business at a Glance



Business Week



Purchasing Week

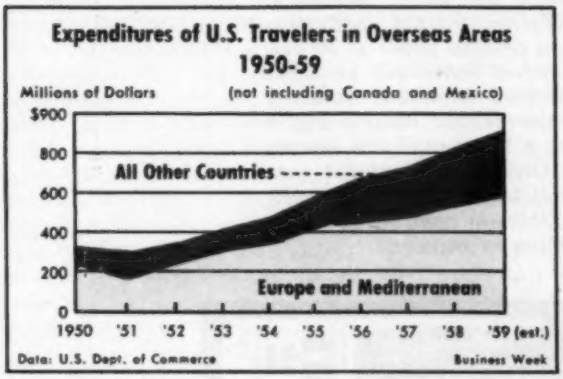
U.S. Business Trend

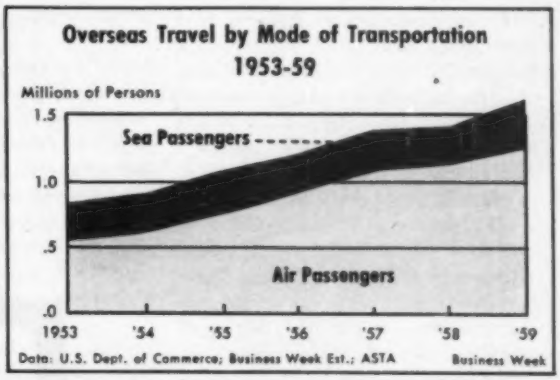
At year-end the index of U.S. business activity reached a record high, after the steel strike dip. Now, with the final strike settlement in early January, the business community unanimously forecasts a surging expansion, at least through first-half 1960. Businessmen's major worry: rising wages and prices – inflation the U.S. can ill afford.

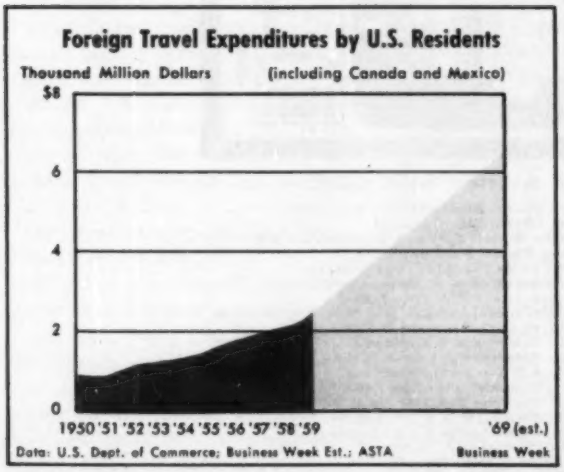
U.S. Commodity Trend

Americans do not expect strong upward price pressure from commodities. Industrial materials indexes (after some strike fluctuations) are barely above last June's levels. In 1960, basic price strength in steel, aluminum, rubber, some chemicals and others may well be offset by price weakness in many agricultural products and in tin, lead, possibly copper later.

● CHARTS OF THE MONTH


Expenditures of U.S. Travelers in Overseas Areas
1950-59
Millions of Dollars
(not including Canada and Mexico)
All Other Countries
Europe and Mediterranean
1950 '51 '52 '53 '54 '55 '56 '57 '58 '59 (est.)
Data: U.S. Dept. of Commerce
Business Week


Overseas Travel by Mode of Transportation
1953-59
Millions of Persons
Sea Passengers
Air Passengers
1953 '54 '55 '56 '57 '58 '59
Data: U.S. Dept. of Commerce; Business Week Est.; ASTA
Business Week


Foreign Travel Expenditures by U.S. Residents
Thousand Million Dollars
(including Canada and Mexico)
1950 '51 '52 '53 '54 '55 '56 '57 '58 '59
'69 (est.)
Data: U.S. Dept. of Commerce; Business Week Est.; ASTA
Business Week

More Yankee Dollars Coming

Rising consumer incomes may enable 1.6-million Americans to go abroad (excluding Canada and Mexico) this year – representing an 8% advance over 1959. More U.S. tourists will visit Europe. But American travelers there will probably stay for shorter periods, and each will spend less. So, even if total U.S. spending in Europe increases, Europe still will receive a diminishing share of the Yankee tourist dollar. Note, too, that Latin America and Asia (primarily Japan) are becoming more popular.

More than 80% of U.S. travelers went by air in 1959. An even greater percentage will fly during 1960, the first big jet aircraft season.

In addition, U.S. spending on foreign travel, including Canada and Mexico, will spurt ahead. Note that an estimated $2,300-million was spent in 1959, another record-breaking year. Travel experts now believe U.S. spending on tourism will jump to $6,500-million by 1969 if present trends continue.

The high-speed Olivetti Divisumma 24 adds, subtracts, multiplies, divides, and provides printed proof of all calculations. Automatic constant retention, automatic re-entry of intermediate results and a unique "memory" are among the Divisumma features that result in faster figure handling, at lower cost. No operator training is required.

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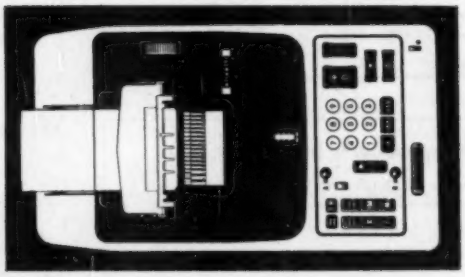

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Can the Americans Compete?

THEY MUST, say government leaders, if the U.S.A. is to grow and maintain its place in the world market.

THEY CAN, say businessmen, with research, cost-cutting, and marketing fervor. Here is what they are doing.

"This country has priced itself out of world markets. We just can't compete with low-cost producers in Europe and Japan."

For the past two years, statements like these echoed in U.S. board rooms. It seemed as if a defeatist attitude toward foreign competition might capture much of the American business community.

But lately there have been signs of a more positive approach. More and more businessmen are taking a crack at the competition, by all the means at their disposal.

The strategy is not simply one of setting up more manufacturing facilities overseas, though that is perhaps its most striking aspect. Many are also looking to the design, production, marketing, and costs of made-in-U.S. products with an eye to meeting foreign competition at home and abroad. And some are blending imports with domestic output for a more complete and less expensive product line.

• **Exhortation**—A steady stream of exhortation from industry leaders and high government officials is urging the businessman to get on with the job. He is told that he *must* compete. He is told that he *can* compete, that the U.S.A. has not "priced itself out of the market" and need not do so in the future.

Government experts and many private economists point out that U.S. prices have hardly risen any faster than those of competitor nations. They insist that far too much significance has been read into the U.S.A.'s 1958-59 export slump. The slump, it is argued, is more the result of temporary factors in world business than of competitive losses.

The U.S. Department of Commerce recently released a study designed to reinforce this argument. After dissecting American exports, by product and by market, 1954 through 1958, the Commerce department reports that the U.S. market share for many important products has been well maintained. Severe competitive losses were confined to a few classes of products (autos, steel, tractors, certain fabrics) while many other exports held even or gained.

• **Foreign View**—Overseas, there are many businessmen who doubt that the Americans have become non-competitive. A recent group of McGraw-Hill reports from abroad included comments like these:

Bombay: "Indians have begun to say that though initial costs of U.S. equipment may be higher, prompt delivery and more efficient operation makes it more economical."

Germany: "If American exporters undertook a serious sales campaign here, you would see the difference before too long."

Brazil: "If the dollars were available, American sales here would double almost overnight."

Yet all these declarations provide little comfort to an American whose low bid of, say, $13,246 to supply a lathe to a U.S. government agency is beaten by a German quoting $8570; or whose offer to supply some heavy equipment overseas is undercut by a Japanese at half the price. Despite reassurance that the U.S.A. is not priced out of the market, the businessman has found that for many specific items, the combination of modern plant, rising productivity, and lower labor costs in Europe and Japan can beat him every time.

• **Reaction**—A few Americans react by demanding high tariff protection and practically abandoning exports. But a more aggressive majority is asking government for better export credit and insurance facilities (which Washington is considering) and insisting that government press foreign nations to reduce barriers against U.S. goods (which Washington is already doing with some success). And in their own plants, at home and abroad, these businessmen are taking action.

The story of American investment in overseas production facilities is well known (IMD—Feb. p12). In the decade of the 1950s, that investment increased two and a half times. This year, Americans plan to spend close to $2,500-million on new plant and equipment outside the U.S.A. (IMD—Oct.p9).

• **New Trend**—These facilities are primarily geared to expand foreign markets. But there is a growing, little-publicized trend to have these plants produce parts or finished goods for the U.S. home market and, possibly, for re-export from the U.S. When a company has no foreign plant it will buy from an independent foreign producer.

No one knows the dollar value of these imports from U.S.-owned manufacturing plants—possibly it is only $500-million. But in time such imports could become an important factor in the U.S. trade balance.

• **Examples** — Last month, *Business Week* reported on some of the arrangements Americans are making. Here are examples:

—Hoover Ball & Bearing Co., an auto-supply company, last month opened a warehouse and sub-assembly plant to process components from a Japanese affiliate and from Britain and Italy.

—A month before, Litton Industries (electronics and office ma-

Innovation—and "Hard Sell"

THE U. S. A. must do nothing less than pit all its engineering genius, its production and sales ability against the surging industrial reawakening overseas.

This from Marc B. Rojtman (above), a man who should know.

Born in Germany, trained on the Continent, 42-year-old Rojtman has become the *Wunderkind* of the U. S. farm equipment industry. Three years ago he took over management of the J. I. Case Co., an aging, sleepy farm tractor maker fast losing markets and money. Today the shrewd and tireless Rojtman (aided by an equally shrewd and tireless wife, who acts as chief personal assistant) has the Case company bustling about home and foreign markets with all the ebullience of a teen-ager. Sales have jumped from $87-million to just over $200-million and profits have reappeared.

The U. S. can compete, says Rojtman, and points to Case's new diesel tractor to prove his point. American farmers are becoming interested in small diesel tractors, and several manufacturers are importing them from European plants. Rojtman admits he did not think Case could compete unless it too imported. But to be sure (and perhaps because he has a low opinion of most European equipment in the field) Rojtman studied the costs of making one in the U. S. A.

He found that with new designs and new automatic production machinery, Case could deliver the machine it wanted more cheaply and efficiently from U. S. plants. For example, the landed cost of an imported engine was 3% higher than the engine Case hoped to build at home. The result is the tractor above, powered by an advanced small diesel which Case believes has a promising future in industrial as well as farm markets.

Pounding the table for emphasis, Rojtman insists that the U. S. is still far ahead of Europe in design and inventive, mass-production engineering. But he warns that Americans do not yet realize the power of the competition they will meet when European industry reaches its peak, "just a few years from now."

Case is getting ready. It is pouring money into new tooling and new products, diversifying into industrial equipment, stepping up its exports and foreign operations. There is great stress on marketing. The Rojtmans, man and wife, have a flair for promotion and dealer relations: There are yearly Detroit-style model changes, easy credit arrangements, and heroic efforts to instill in dealers new incentives and modern selling methods.

Each year, Case mounts an extravaganza for dealers, flying them and their wives in batches of 500 to a resort (last year, Miami) to see new models, learn sales tactics, absorb enthusiasm—and place orders. The latest affair (which cost Case close to $1.3-million) was capped by the Rojtmans' gleeful announcement that for the 1961 "World Premiere" it would fly, for only a token payment, qualifying dealers and their families to Paris—perhaps 5,000 persons. Expensive? But Rojtman insists that it sells tractors.

chines) bought control of Svenska Dataregister AB. The plan: Sell the Swedish firm's cash registers through the many U. S. outlets of Monroe Calculating Machine Co., another Litton subsidiary.

—The Bendix company's French plant makes small refrigerators. Now Bendix thinks these would sell well for trailer, boat, and cottage use in the U. S. A. So rather than tool up in America, Bendix will bring them in from France.

—A U. S. drug company with a British plant initially processes an antibiotic in the U. S., ships it to Britain for more processing and packaging, then brings it home.

—Cummins Engine Co.'s Scottish plant exports 10% of its castings and forgings to the U. S. A. . . . Arnold Schwinn & Co. goes abroad to buy brakes, pedals, spokes, gears for its bicycles; all it does in the U. S. is make frames and assemble the units. . . . The electronics industry imports a great deal: Motorola buys transistors from Japanese firms. Others do the same thing in Italy.

—Latin America participates, though to a much lesser extent. Mexican subsidiaries of Motorola, Majestic, and Lenkurt Electric ship condensers, aerials, and small radios to their U. S. parents.

• **World View**—For some of the less internationally-minded U. S. executives, such importing is an evil necessity, done reluctantly, and not talked about. For others, these tactics seem natural to a "one-world" view of business operations: Produce where the cost for a product or component is most advantageous; combine output from plants in different countries for a full, international product line; sell wherever you can, from whichever plant or group of plants is most convenient.

Despite the mounting emphasis on foreign plants and imports, most economists agree that some wholly U. S-made products are competitive in world markets. They mention jet aircraft, railway locomotives, complex electronic gear and tools—or, at the other end of the scale, mundane items such as coal and inexpensive, mass-produced women's wear.

• **All-Out Effort**—And you hear businessmen like Marc Rojtman (above, left) who declare that,

given an all-out effort toward better design, tooling, and marketing —and a national determination to control inflation, the broad range of U.S. industry can hold its own in the world.

The big question: Will the Americans make the effort? It will be years before an answer can be given. But there is evidence now that manufacturers are accepting the challenge. For example:

—General Electric Co. (which recently announced it would no longer seek government protection from imports) is concentrating on marketing, redesign, production efficiency. It has begun to use huge, highly-automated tools to make turbines, and has redesigned large transformers so that they can be built on modular lines, allowing greater standardization.

—A small hand shovel maker stripped his product of non-essentials, mechanized his shop, and sells a good quality tool for just a few cents more than a Japanese import.

—Jacobs Mfg. Co., a maker of chucks, was threatened by European competition. But it has managed to bring costs down by 20% by retooling and automation.

—Eastman Kodak Co. believes that mass production and constant new product development, backed by heavy advertising, has helped it hold its place in a camera market besieged by foreigners.

—The oil equipment industry is reported to be making a heroic effort to liberalize export credit terms and improve service.

—The machine tool industry is launching a drive for standardization around the "building-block" concept of tools. And though it is hard-pressed by foreign competition in some lines, it is selling a larger number of special purpose, automatic machines to Asian, European, Latin American buyers.

—The U.S.A. will this year spend about $12,500-million on research and development; industry's spending, at $9,500-million, has jumped 160% in the last six years. Many observers predict that the new processes and products flowing from this massive "R and D" effort will help the U.S.A. maintain, and possibly improve, its position in a highly competitive world. ●

How They Captured the Market

A Singapore syndicate controls pepper, reaping huge profits while supplies dwindle and prices soar. It is a classic example of a commodity "corner."

A SYNDICATE of Chinese merchants in Singapore, known as the Wan Tong Trading Co., has successfully completed one of the classic maneuvers of speculative finance, a "corner" in a commodity. The commodity: pepper.

To corner—or win command of—the market for any commodity is a major accomplishment, even with a commodity as small as pepper (world production is worth only $60 million a year at current wholesale prices). Overproduction and low prices set the stage, in a market that has steadily disintegrated since Korean War days.

While not all the details of the corner are available, a recent report in *Business Week* revealed the syndicate's tactics:

—Early in 1958, the syndicate first sensed that a corner could be made. Its agents in Indonesia sent back information no other dealers knew: Indonesian farmers—discouraged by low prices—were sharply reducing their 1958 and 1959 crops. With a shortage inevitable, the syndicate's modus operandi became clear: Step into the pepper market and quietly buy up as much of the available supply as possible.

By mid-1958, Wan Tong started to purchase all the Sarawak and Muntok pepper it could get its hands on. Its moves were disguised by a dense screen of dealers and agents.

Through 1958 and into 1959, Wan Tong skillfuily manipulated the market. Old crops were dumped at cost while new crops were snapped up. Also, the syndicate sold short, creating a bearish market sentiment. And this induced other dealers to follow suit. Wan Tong covered its position with pepper on hand.

—In December 1959, most dealers learned that India's big Malabar crop would be late because of heavy rains. The Malabar harvest is critical since it is the last and biggest of the season. Wan Tong was then ready to spring its trap.

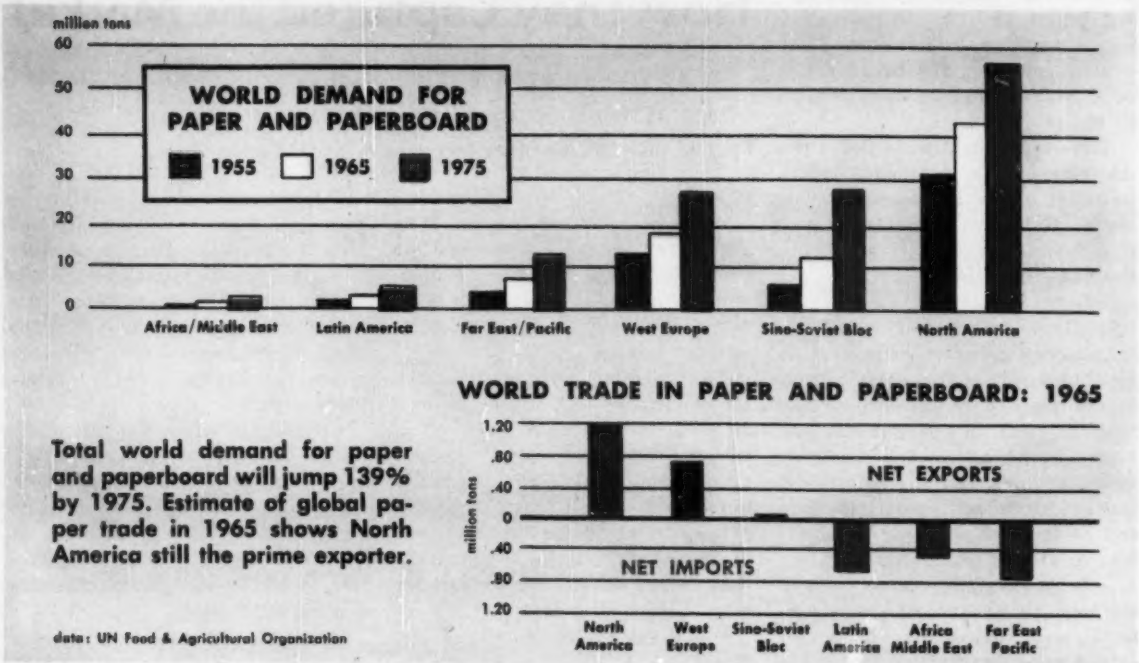
Dealers suddenly heard for the first time what the syndicate had known all along—that crops were being cut back. Also these traders were stunned to learn that little supply was available and that the Wan Tong group had control of almost all of the floating crop—7,500 tons.

• **1960**—Statistics appear to be on the side of the syndicate during 1960, according to *Business Week*. The pepper shortage may come to 10,000 tons, with consumption at 60,000 to 65,000 tons and production at 55,000 tons. This estimate may be optimistic.

There is little that producers can do during 1960. Sarawak growers have little time to intensify production since their next crop is due next June. Brazil's black pepper will not be available until next November. India's Malabar crop would be entirely too late to be a factor.

• **Dole it Out**—So, Wan Tong will dole out its pepper slowly and is in a perfect position to increase its huge profits. Note how New York's spot prices reacted soon after the corner became known. Quotations for black pepper shot up to 60 cents per pound from 24 cents last July and white pepper reached 75 cents. And as INTERNATIONAL MANAGEMENT went to press in January, black pepper had reached 85 cents and white $1.28 (the highest since September, 1954). Some traders in New York are convinced the syndicate could push prices even higher this year.

Only one hope remains for the trade in 1960: One of the two known companies in Wan Tong's syndicate does a lot of trading in rubber. In September, the group needed money to keep active in a rising rubber market. To get capital, Wan Tong began to ship pepper to New York, and by year end these shipments totaled 700 tons. But, the big question still remains: How long can Wan Tong afford to keep pepper tied up? (*Business Week, Dec.* 19, *p* 106)



Total world demand for paper and paperboard will jump 139% by 1975. Estimate of global paper trade in 1965 shows North America still the prime exporter.

data: UN Food & Agricultural Organization

New Investments, New Techniques

IN INDIA, a mill now is being constructed to blend bagasse—sugar cane waste—with rags and rope to produce writing and printing paper. In Argentina, a planned paper facility would blend kenaf fiber with bagasse. In Tunisia, esparto grass will be used to make bleached market pulp.

These new plants are but one aspect of the fast-growing paper market, a giant that now accounts for 3% of total world exports by value (compared to about 5% for iron and steel).

• **Investment**—New investment in world papermaking capacity needed to further paper's advance will have to average $1,000 million yearly up to 1965 and then must be increased to $1,500 million in the 1965-75 period. About 50% of this investment will be required in the high-consumption areas of North America and Western Europe.

I. Meeting the Paper Deficit

The rest is required for new investment in papermaking capacity in the underdeveloped countries, which neither can nor want to rely so heavily on imports in the future as they have in the past. Latin America, for example, should invest $65 million per year up to 1965 and $125 million annually between 1965 and 1975, according to the U. N.

Local capital in the paper-deficit regions can only partially meet the demand for new facilities. U. S., British, and Scandinavian companies are carefully studying the market potential in the underdeveloped countries. Many are now either actively engaged in, or are considering, manufacturing operations, participation in joint enterprises or licensing arrangements in the larger markets of the southern hemisphere.

• **Consumption** — Global consumption of paper and board has doubled in the last 20 years. And this impressive advance should continue through the '60s—thanks to growth in world population (to rise 23% by 1970). According to experts of the U. N. Food & Agricultural Organization (FAO), world demand for paper and board could rise to 88 million metric tons by 1965 and then climb to 134 million tons by 1975 (see chart above).

But remember these FAO market projections tend to represent latent rather than actual demand. Paper consumption is always a reflection of educational and living standards. It only rises as these are improved; and in the less-developed regions much improvement is needed before the most optimistic forecasts for paper are realized.

II. Technical Strides

Paper technology, meanwhile, is making rapid strides, and should be able to meet future needs with little difficulty. New processes promise that short fiber materials, such as bagasse and hardwoods, can play an important role in supplementing the traditional long-fibered soft woods in papermaking. In fact, some researchers and engineers say that within 20 years, the shorter fibers could be the source of between 25% and 50% of the world's paper.

This trend may even be reflected in areas rich in short-fiber soft woods. Hardwoods comprise about 50% of the timber stands in the southern U. S. A., and the new "cold soda" process, one of the outstanding advances in paper technology in the past five years, has proved that they can make good quality paper. This "cold soda" process offers special promise to many tropical lands, rich in hardwoods but lacking enough softwoods.

Equally important in tropical areas will be greater use of plants such as sisal, hemp, kenaf, and ramie (all long fibers). Researchers are confident that these fibers can be blended with softwood, bagasse, or bamboo to make an acceptable paper. For instance, Parsons & Whittemore Inc.—a U.S. firm of paper mill engineers—is optimistic about project in Argentina which would blend bagasse and kenaf.

III. Major Suppliers

Despite the development of new capacity based on local resources in paper deficit areas, the major suppliers of North America and Europe expect gradually rising export markets. Indeed, U.N. experts forecast shortages over the next 15 years. They have urged the principal suppliers to plan reserve capacity that can moderate price fluctuations, stabilize the market.

In North America, paper executives are confident that their industry is entering the '60s in good shape. They expect their modernized mills to be operating at 90% to 95% of capacity this year (compared to 85% in 1958), and while exports will rise, North Americans believe they will have their hands full keeping up with fast-rising demand at home.

Scandinavia's paper industry is considered in good form to take advantage of the next decade's growth in world markets. In continental Western Europe, exploding personal consumption promises great growth for the paper industry. But some observers suggest that the continental industry, with many small companies that got into business right after World War II, faces a thorough-going rationalization—with mergers and marketing agreements—if it is to be efficient and competitive.

• **Russians, Too**—Despite its vast resources for papermaking, the Soviet bloc is not expected to be a very large factor in the world market during the '60s. Domestic requirements are rising rapidly, and Moscow's rulers will have to live up to their promises to improve living standards. However, most observers expect the Russians to supply a certain amount of paper, particularly newsprint, in their campaign to win friends and influence. ●

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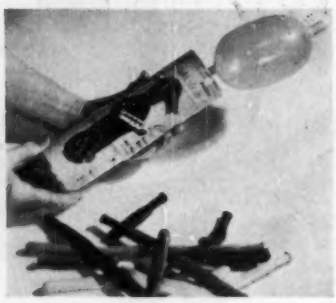
Follow the Arrows to

Pump-Action Fibre Can

started with INSECTICIDE DUSTER . . .

. . . inspired bellows for TOY BALLOON . . .



. . . heads for new success as GRIT DISPENSER

Roll-On Applicator

started with DEODORANT . . .

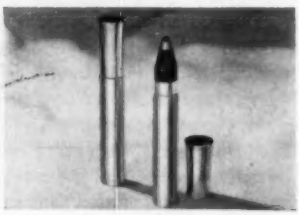
. . . and quickly was adapted for . . .

GLUE

PAINTS

GARLIC OIL

LIP ROUGE



Key-Opening Can

started with SARDINES . . .

. . . became standard for COFFEE and SHORTENING . . .

. . . launched huge success for NUT MEATS . . .

. . . extended shelf life for CANDY and TOBACCO . . .

Packaging Success . . .

WHEN THE EDITORS of *Modern Packaging* asked the magazine's readers where they got their best packaging ideas, the most frequent answer was, "We get them from *Modern Packaging.*"

This was not just a tribute to one business publication, as the editors were quick to admit. It was also recognition of a basic principle of packaging: The elements of packaging are common to every kind of industry, covering every conceivable product, be it consumer or industrial, food, drug, cosmetic, chemical, hardware, or software. The principles of protection, convenience, economy, and sales appeal apply equally to all.

It is a fact, says *Modern Packaging,* that the packaging man who watches only what competitors do will never beat them on anything. The priceless, "market-sweeping firsts" come from constant study of packaging innovations in other industries—which, with a little imagination, are then adapted to the particular product.

But whether looking for a "first" or for just a good packaging idea, the alert packaging man watches all developments. Here are a few of the adaptations that have been made in recent years:

• **The Flip-Top Box**—Cigarettes were the first application, about four years ago (though the idea is 25 years old). Then an alert pharmaceutical house—Ciba—saw the possibilities for packaging throat lozenges. The company not only borrowed the idea, but started packaging operations in a friendly tobacco factory. Next came adaptations for pencils and crayons, and, more recently, a soil conditioner that is molded into a cigarette-like stick and sold in 10-box cartons.

• **The Aerosol Can**—The first aerosol package was an insecticide "bug bomb," introduced in 1944 for military use. The breakthrough came from an imaginative dairy-products manufacturer who asked: Why not put whipped cream into a self-dispensing aerosol can?

• **Plastic Squeeze Bottle**—First appearance was in 1947 as an atomizing package for underarm deodorants. Within six years, the idea was adapted for no less than 2,000 products in 30 industries.

• **Foamed Plastics**—Lightweight and form-molded, foamed plastic (expanded polystyrene) found its first use as a protective shipping cushion for drugs. Then a manufacturer of baby products adapted the idea into a display tray for gift sets; a candy maker began packing chocolate-covered taffy in foamed-plastic boxes.

• **Heat-Sealed Film**—Mail editions of *The New York Times* are now packaged in heat-sealed film because *The Times* mailroom foreman went shopping with his wife. The idea came while he watched meat being packaged in a supermarket for self-service shopping.

• **Pegboards and Gravity Feed**—From the hardware industry, the Eastman Kodak company got the idea to package inexpensive cameras in blister packs on pegboards; from the drug industry the idea to put lens cleaners in gravity-feed counter dispensers; from the beverage industry the idea for twin-pack film rolls.

• **Constant Parade**—There is, in brief, a constant parade of packaging ideas that an alert observer should not miss. A Swedish manufacturer molds and wraps concentrated soup like a chocolate bar. A maker of mop sticks gets his floor-display idea from a stand designed for baseball bats. Tetrahedron-shaped containers appear for milk and ice cream, are soon seen as transparent, single-use packages for soap and suntan lotion. The tear tape finds a new use in interior packaging, on plastic bags containing cake mix.

• **Machinery, Too**—The same principle applies for machinery. One company has adapted a vacuum-pick-up labelling machine as a filler for packing multiple layers of bouillon cubes into plastic containers; another company uses a labelling machine to pick-up and seat rosette-shaped cover disks on shaving-soap mugs; a third company uses the same machine to lock manicure instruments inside a plastic-top cardboard package.

The same basic filling machines can be equipped to handle motor oil or paints; pouch-forming equipment may be used to package potato chips or chemicals. (*Modern Packaging, Dec., p95*)

. . . and is still invading new fields like HOSIERY . . .

. . . and surprisingly, even ALARM CLOCKS

Trade Fairs: More Emphasis on

Fairs in 1960: An International Sampling

AFGHANISTAN		
Jeshyn Fair	Kabul	Aug 23–29
ALGERIA		
Int'l Trade Fair	Algiers	Apr 29–May 15
AUSTRALIA		
Olympic Cavalcade	Melbourne	Mar 9–19
Sydney Eng'g Exhib	Sydney	July 18–23
AUSTRIA		
Int'l Spring Fair	Vienna	Mar 13–20
Graz Southeast Fair	Graz	Apr 30–May 8
Int'l Expo. & Trade Fair	Dornbirn	July 29–Aug 7
Int'l Fall Fair	Vienna	Sept 4–11
BELGIUM		
Int'l Inventors Show	Brussels	Mar 5–15
Int'l Trade Fair	Brussels	Apr 30–May 11
Int'l Trade Fair	Liege	June 2–16
Int'l Trade Fair	Ghent	Sept 10–25
Int'l Technical & Industrial Exposition	Charleroi	Sept 15–26
CANADA		
Canadian Hardware Show	Toronto	Feb 8–11
Nat. Office Management Conf. & Expo.	Montreal	May 22–26
Pacific National Exhib.	Vancouver	Aug 20–Sept 5
Int'l Trade Fair	Montreal	Oct 25–Nov 5
CZECHOSLOVAKIA		
Int'l Trade Fair	Brno	Sept 4–18
FINLAND		
Finnish Industries Fair	Helsinki	Sept 16–Oct 2
FRANCE		
Int'l Agricultural Machinery Show	Paris	Mar 1–6
Int'l Trade Fair	Lyon	Mar 12–21
Building Materials & Construction Exhib.	Paris	Mar 17–27
Int'l Fair of Nice	Nice	Mar 26–Apr 6
Int'l Trade Fair	Lille	Apr 23–May 8
Int'l Trade Fair	Paris	May 14–29
Int'l Trade Fair	Bordeaux	June 12–27
The European Fair	Strasbourg	Sept 3–18
Int'l Trade Fair	Marseille	Sept 17–Oct 3
Int'l Automobile & Cycle Show	Paris	Oct 6–16
Int'l Office Equip. Fair; Int'l Mater. Handling Fair; Int'l Packaging Fair	Paris	Oct 14–23
GERMANY		
Int'l Toy Fair	Nurenberg	March 3–8
Int'l Leather Goods Fair	Offenbach	March 5–10
Frankfurt Int'l Fair	Frankfurt	March 6–10
Int'l Trade Fair (Household Goods)	Cologne	Mar 11–14
German Industries Fair	Hanover	Apr 24–May 3
Interstoff Textile Fair	Frankfurt	June 28–July 1
Int'l Fall Fair	Frankfurt	Aug 28–Sept 1
German Industries Exhib.	Berlin	Sept 10–25
Int'l Photo. Exhibit	Cologne	Sept 24–Oct 2
General Provisions & Fine Foods Exhib.	Cologne	Sept 26–Oct 4
German Soap & Cosmetics Fair	Berlin	Oct 15–18
Int'l Exhib. of Measuring Instr. & Automation	Dusseldorf	Oct 19–26
GERMANY (Soviet Zone)		
Int'l Fair	Leipzig	Feb 28–Mar 8
Int'l Fair	Leipzig	Sept 4–11
GREECE		
Int'l Fair of Thessaloniki	Salonika	Sept 4–25
HUNGARY		
Budapest Industrial Fair	Budapest	May 20–30
INDIA		
World Agriculture Fair	New Delhi	through Feb 14
ITALY		
Int'l Agricultural Fair	Verona	Mar 13–21
Int'l Samples Fair	Milan	Apr 12–27
Int'l Handicraft Fair	Florence	Apr 24–May 16
Bologna Int'l Trade Fair	Bologna	May 8–22
Int'l Samples Fair	Padova	May 29–June 13
Electronic & Nuclear Energy Exhib.	Rome	June 13–29
Int'l Trade Fair	Trieste	June 26–July 10
Int'l Technical Expo.	Turin	Sept 24–Oct 5
Italian Machine Tool Expo.	Milan	Sept 29–Oct 9
JAPAN		
Int'l Trade Fair	Osaka	Apr 9–26
Int'l Book Exhibit	Tokyo	Nov 22–30
LUXEMBOURG		
Int'l Trade Fair	Luxembourg	May 26–June 5
Furniture Fair	Luxembourg	July 9–16
MALTA		
Int'l Trade Fair	Valletta	June 30–July 10
MEXICO		
Nat. Expo. of the Animal Industry	Mexico City	Feb 19–Mar 6
MOROCCO		
Int'l Fair	Casablanca	Apr 28–May 15
NETHERLANDS		
Furniture Trade Fair	Utrecht	Feb 29–Mar 5
Int'l Trade Fair (Consumer)	Utrecht	Feb 29–Mar 5
Int'l Horticultural Expo.	Rotterdam	Mar 25–Sept 25
Int'l Household Fair	Amsterdam	Mar 28–Apr 6
Int'l Trade Fair (Tech.)	Utrecht	Apr 5–14
Int'l Plastics Fair	Utrecht	Oct 19–26
PAKISTAN		
Pakistan Industries Fair & Exhib.	Dacca	Feb 29
POLAND		
Poznan Int'l Fair	Poznan	June 12–26
PORTUGAL		
Int'l Trade Fair	Lisbon	June 9–23
SAUDI ARABIA		
Agric. Show & Trade Fair	Manama	Mar 31–Apr 7
SPAIN		
Int'l Samples Fair	Valencia	May 1–20
Int'l Samples Fair	Barcelona	June 1–20
SWEDEN		
Int'l Swedish Industries Fair	Goteborg	May 21–29
Int'l Trade Fair	Helsingborg	June 3–12
St. Erik's Fair	Stockholm	Aug 30–Sept 11
Instruments & Measurements Exhib.	Stockholm	Sept 10–17
SWITZERLAND		
Int'l Auto Show	Geneva	Mar 10–20
Swiss Industries Fair	Basel	Apr 23–May 3
Swiss Import Exhib.	Zurich	May 20–29
Swiss National Fair	Lausanne	Sept 12–27
SYRIA		
Damascus Int'l Fair	Damascus	Aug 15–Sept 10
TUNISIA		
Int'l Fair	Tunis	Oct 14–30
TURKEY		
Int'l Fair	Izmir	Aug 20–Sept 20
UGANDA		
East African Trade & Agr. Fair	Kampala	Feb 10–15
UNION OF SOUTH AFRICA		
Rand Easter Show & Industrial Exhib.	Johannesburg	Apr 4–23
UNITED KINGDOM		
British Toy Fair	Brighton	Feb 15–19
Ideal Home Exhib.	London	Mar 1–26
Nat. Stationery & Book Trades Fair	London	Mar 28–Apr 1
Int'l Clothing Trade Exhib.	London	Apr 7–13
Int'l Mechanical Handling Exhib.	London	May 3–13
Int'l Hardware Trades Fair	London	May 9–13
Instruments, Electronics & Automation Exhib.	London	May 23–28
Int'l Machine Tool Exhib.	London	June 25–July 8
Nat. Radio & Television Exhib.	London	Aug 24–Sept 3
British Food Fair	London	Sept 1–17
Business Efficiency Exhib.	London	Oct 3–12
Int'l Motor Show	London	Oct 19–29
UNITED STATES		
Int'l Toy & Trade Fair	New York	Mar 6–11
Radio Engineering Show	New York	Mar 21–24
Atomfair	New York	Apr 4–7
Int'l Auto Show	New York	Apr 16–24
Tool Show (ASTE)	Detroit	Apr 21–28
Washington State Int'l Trade Fair	Seattle	Apr 28–May 8
Super Market Exhib.	Atlantic City	May 1–4
U. S. World Trade Fair	New York	May 4–14
Amer. Textile Mach. Exhib.	Atlantic City	May 23–27
Design Engineering Show	New York	May 23–26
Chicago Int'l Trade Fair	Chicago	June 20–July 5
Western Packaging & Materials Handling Expo.	Los Angeles	July 19–21
California State Fair	Sacramento	Aug 31–Sept 11
Production Engineering Show	Chicago	Sept 6–16
Machine Tool Exposition	Chicago	Sept 6–16
Int'l Instrument-Automation Exhibit	Los Angeles	Sept 12–16
Texas Int'l Trade Fair	Dallas	Oct 8–23
Nat. Metal Congress & Expo.	Philadelphia	Oct 17–21
Western Tool Show	Los Angeles	Nov 14–18
Industrial Building Expo.	New York	Dec 12–15
YUGOSLAVIA		
Int'l Trade Fair	Zagreb	Apr 30–May 15
Int'l Chemical Exhibition	Belgrade	June 1–10
Int'l Technics & Technical Achievements Fair	Belgrade	Aug 23–Sept 2
Int'l Trade Fair	Zagreb	Sept 10–25

the "Vertical"

THE LIST at left is a sampling of some of the important international trade exhibits scheduled in 1960. There will be hundreds more, particularly specialized affairs catering to everyone from babies (Baby Goods & Perambulators Show—Cologne, January) to bottlers (Bottling Equipment Exhibition—Paris, November). It would take a large corps of hardy executives to cover all the shows for any one company.

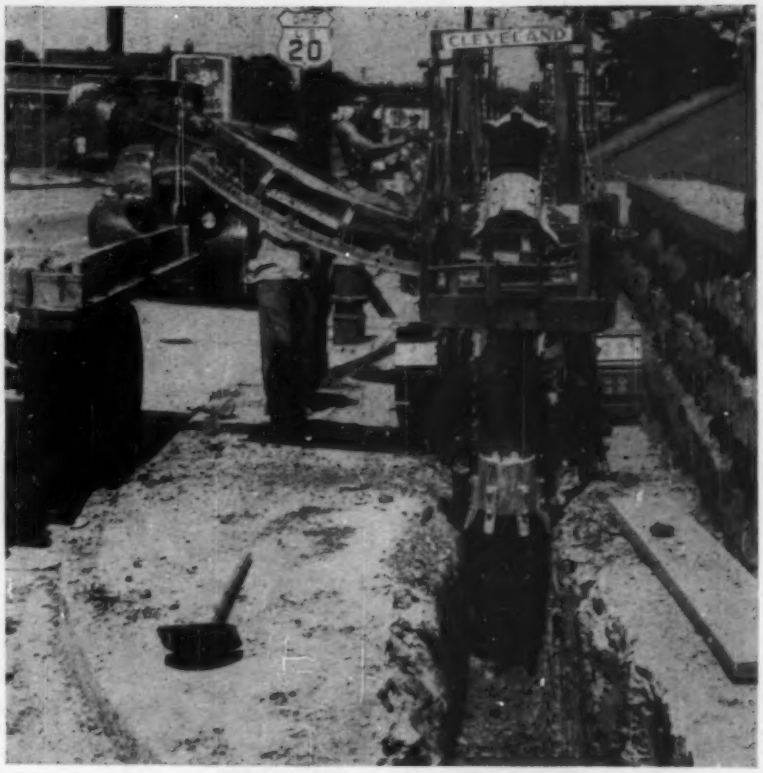
Yet it is a tribute to their efficacy as a marketing technique that so many more companies try to see —and be seen at—trade fairs. For example: The Milan Fair in 1939 had 5088 exhibitors and 2-million visitors; last year there were 13,400 exhibitors, 4.3-million visitors. Barcelona attracted 1800 exhibitors in 1951, more than 9,000 in 1959.

• **Successful** — The reason, according to a report in *The Times Review of Industry* of December, is that modern fairs have been "amazingly successful" as instruments for promoting trade.

But success brings growing pains. Many marketing men have found that the all-inclusive, "horizontal" fair, with its hordes of public visitors, is too costly, and specialized "vertical" exhibits are in the ascendancy. One British study found that general fairs cost exhibitors from $84 to $1120 for every serious trade inquiry whereas smaller specialized fairs can produce them for as low as $6.

Specialized industry shows have been the rule in the U. S. A. for years (though some advertising managers have begun to complain bitterly about the cost of even one-industry exhibits). Now they are becoming preferred by many businessmen in the fast-integrating European market.

But while general fairs will have some difficulty, they probably will not disappear. *The Times Review* suggests that general fairs, especially in industrialized lands, will gradually become "fair-expositions" with the main accent on prestige displays for the general public, while the true "businessman's fair" will show the products of one industry, or at most an allied group of industries. ●



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SINCE 1864
DEUTZ
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SINCE 1864
MAGIRUS
Trucks and buses powered by aircooled DEUTZ diesel engines, utility vehicles, fire ladders, fire engines, tank trucks, two-wheel ladders, fire-fighting appliances
KLÖCKNER-HUMBOLDT-DEUTZ AG · KÖLN
GERMANY

"158 Agencies in 123 Countries"

Listeners become buyers as radio stations sell . . .

130,000 Radios at $12 Each

RADIO STATIONS require listeners, listeners require radios. This simple logic has led to sales of 130,000 radios in 13 months—an average of 10,000 per month—for an enterprising Mexican manufacturer, Radio Impulsora Mexicana, S.A. The company has signed 85 radio stations as exclusive "dealers" for its "Majestic Cometa" model, a five-tube set that sells for the equivalent of only $12.

The low price is possible because there is no middle man and no advertising cost, and because the stations take no more than a token mark-up ($1.60 per set).

• **Profits Secondary** — For the stations, the important objective is goodwill and publicity, and the opportunity to widen their audiences. Many buyers are poor people who have never had a radio before; they walk into the stations bringing their money in bags of coins. Others, representing higher income levels, want the radio as an additional set; some Mexican households now have five or six receivers in different rooms around the house. Young people—"teenagers"—are big buyers.

The stations are free to promote the radios by their own methods. One station, for instance, likes to have buyers come inside the station (picture) and look around; another station promotes home delivery through a popular broadcaster who exhorts his listeners to telephone in for "immediate delivery by our motorniks."

Although profit is not the goal, the commissions do accumulate. Some stations write them off as payments for advertising; others use the money for a Christmas bonus to employees—thus encouraging the sale of more radios.

• **No Headaches**—For the company, the scheme provides a distribution system with built-in publicity facilities, with no cost or headaches for the company.

What's New in Vending Machines

MOST IMPORTANT NEWS in automatic vending is the bill-changing machine developed by the U.S.A.'s ABT Corp. At present, the machine's scanner can handle only U. S. $1 bills. The machine could increase the sales volume from other vending machines.

Other new American machines include a soft-drink machine that shaves ice into the cup (APCO, Inc.); a coffee-brewing machine that makes individual cups in six seconds (Rudd-Melikian, Inc.); and a toasted-sandwich dispenser (Star Cooler Co.).

Denmark's Wittemborg Automat company has installed a dispenser for fresh flowers in the Paris airport, and has developed a general-purpose vendor that dispenses hot and cold foods, groceries, and dry-goods items. From Britain come at least three rival tea-brewing machines. ●

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REPRESENTATIVES IN 36 COUNTRIES

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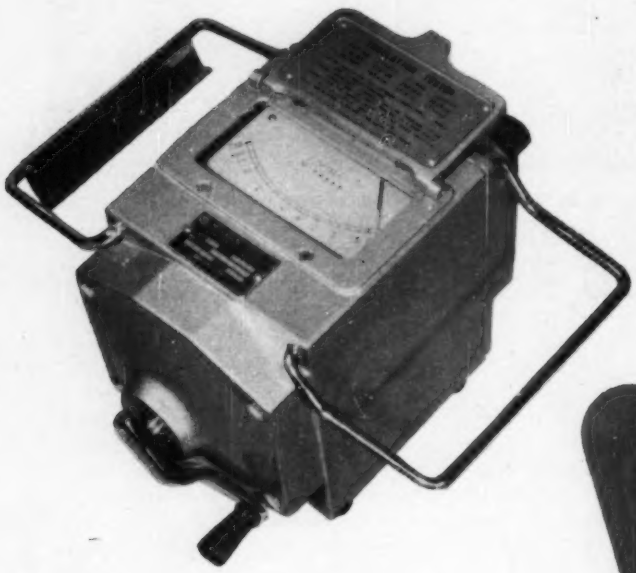
HITACHI

INSULATION TESTERS



7

Profitable Features

Consisting essentially of an insulation resistance measuring element and a hand-driven dynamo for current supply, this rugged little unit can be used for testing insulators, cables, electrical instruments and transmission lines. It is designed for voltages ranging from 100V to 2000V and is available in double-scale type, double-rating type, etc. Built in strict conformity to Japanese Industrial Standards (JIS C 1301) and Japanese Export Standards, and guaranteed by the name it proudly bears—Hitachi.

- ***Fast Accurate Readings:*** Clear and precise calibrations, a magnified scale and a fast, non-fluctuating needle assure quick and accurate readings under all conditions.
- ***Unaffected by External Magnetic Fields:*** Internal magnet cross coil system eliminates any error resulting from the influence of external magnetic fields, even when used near a circuit carrying a large current.
- ***High Durability and Efficiency:*** The use of small, lightweight parts gives the tester a high resistance to vibration and impact, and permits immediate use without time-consuming leveling adjustments.
- ***No Infinity Adjustments Necessary:*** The high rotating power of movable parts and the adoption of a shielding plate makes infinity adjustment unnecessary, even in High Rating Insulation Testers of the 100V 2000M class.
- ***Full Protection from Dust, Moisture:*** A sturdily-constructed light metal casing and special seals at all joints afford complete protection from dust and moisture; ensuring continued, trouble-free service.
- ***No Current Leakage Errors:*** Guard rings for high voltage line terminals and a specially-designed change-over switch prevents any current leakage into the measuring circuits and eliminates any possibility of error.
- ***Light and Compact:*** Exterior dimensions conform to Japanese Industrial Standards for Small Type Testers but weight has been kept down to 2.5 kg.

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- Sheet and Strip Steel
- Steel Roofing and Siding
- Electrical Steels
- Electro-Plated Sheets
- Steel and Plastic Pipe
- Plastic-Coated Pipe and Tubing
- Line Pipe, Casing, and Tubing for the gas and oil industry
- Boiler and Heat Exchanger Tubes
- Mechanical and Structural Tubing
- Electrical Conduit
- Tin Plate
- Terne Plate
- Bolts, Nuts, and Rivets
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- Metal Powder
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- Pig Iron

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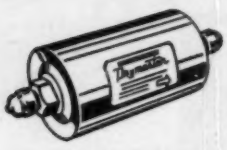
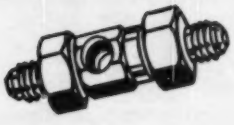
refrigeration and air conditioning

For virtually every refrigeration and air-conditioning need, Mueller Brass Co. offers high quality components, including filter-driers, strainers, valves, heat exchangers, tube and fittings, manifolds and service accessories.



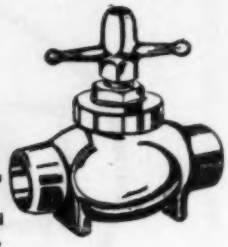
Drymaster®

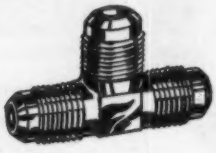
Filter-Driers provide perfectly balanced filtering and drying to meet every installation need. Complete range of sizes and capacities.



Globemaster

Packed line valves, available in straight-thru and angle types, are carefully engineered and constructed to give long, trouble-free service.





FITTINGS

Mueller Brass Co. produces a complete line of both solder-type or flare fittings in a range of sizes and styles to accommodate every type of refrigeration installation. Manufactured from seamless copper tubing, forged brass or brass rod fabricated in our own mills.

Sightmaster

Liquid indicators utilize light refraction to indicate refrigerant level. Can't leak, shock-proof mounted . . . in single or double port models with flare or solder end connections.

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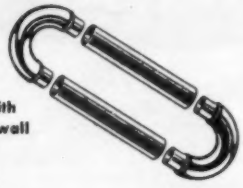

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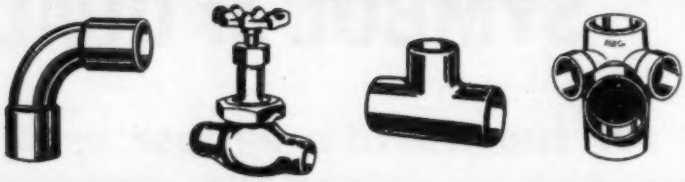

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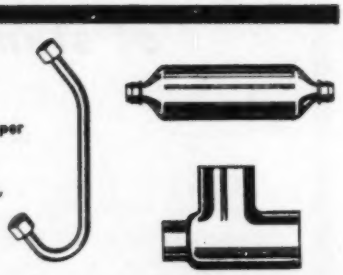

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276

Nordhoff builds sturdy cars and loyal workers (right), men who soon may be . . .

New Owners to Help VW Grow

A PARADE of 20 snow-white Volkswagen convertibles led the way to the church in Wolfsburg, West Germany, on the day Elisabeth Nordhoff married Dr. Anton Piech, grandson of Volkswagen-designer Ferdinand Porsche. The shrewd publicity was engineered by Elisabeth's father, Dr. Heinz Nordhoff (above and cover picture), who in 12 years has built Volkswagenwerke GmbH. from practically nothing to the largest vehicle producer outside of the U.S.A.

Nordhoff's talents and organizing ability this year will help move an estimated 770,000 VW cars, trucks, and buses onto the world's highways, about 10% more than in 1959. Every third West German car-owner today drives a VW. And the beetle-shaped "people's car" has found its way into every country of the world.

• **Year of Decision**—Despite this phenomenal growth, the year 1960 will be a year of decision and change for Nordhoff and VW. Most important, Volkswagen will be getting new owners, since 60% of its government-owned stock is scheduled to be sold to the public.

Also, Nordhoff sees the threat of rising competition, even though VW's still are being sold almost as fast as they come off production lines. He is aware of the strong bids being made by Italy's Fiat and France's Renault, among others.

Nordhoff's eye is on the changing tastes and changing pocket-books of German motorists. Many already are switching from the proletarian VW to Mercedes, Opels, and other larger cars.

I. The Changing Market

Nordhoff and his associates have watched the European consumer graduate from bicycles to scooters, from scooters to small cars. Today there is a wide gap in price between cars like the VW and more expensive makes. VW executives have been studying this market "vacuum"—wondering if it provides room for an improved VW, or an entirely new car.

Nordhoff has been keeping his VW mechanically up-to-date. The latest models have an improved engine, and cars will have an automatic clutch in the spring. But those who know Nordhoff believe that he may be planning on more revolutionary changes.

• **Designer & Sales Engineer**—A graduate engineer, 61-year-old Nordhoff began as an airplane-engine designer in the 1920s, then joined Adam Opel AG., a General Motors Corp. affiliate, as head of its service department. He studied GM production and sales methods in the U.S.A., and returned to Germany with increased responsibilities at Opel.

During the war, he ran Opel's huge truck plant, and because of this he was banned from the auto industry by the occupying powers after the end of hostilities. British authorities brought him back to help rebuild Wolfsburg and its VW plant.

Part of Nordhoff's genius has been an ability to surround himself with exceptional engineering and marketing talents, and a loyal working force. Many top VW men worked for either Opel or Auto Union (DKW) before the war.

Nordhoff has earned the loyalty of workers by giving them top wages—equivalent to 75¢ an hour—and the best working and living conditions. In the past dozen years, VW has spent nearly $20-million on employee housing, another $2.5-million on public works. These prospering workers soon will have a chance to get a financial stake in the company.

II. New Owners

Since the war, Volkswagen literally has had no owner. Nordhoff has reported to trustees and a board of directors. The Bonn government has watched over the operation, but its legal rights have been contested by the State of Lower Saxony, which assesses taxes on VW operations.

All of this will be changed during the coming year, as 60% of VW

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stock is put up for public sale, another 20% handed over to the Bonn government, and the remaining 20% to Lower Saxony. Through their joint 40%, the federal and state governments will hold a controlling interest.

• **Revenue from Sales**—The proceeds from the public sale of stock DM 720-million—will be loaned to the federal government for 20 years at 5%. The annual yield from this source will be added to dividends from government stock to finance an educational and scientific foundation.

Details on the distribution of the public stock are still being worked out. Bonn officials would like to see the stock distributed as widely as possible, after the pattern of the Preussag sale (IMD, May '59), perhaps with a limit of 10 shares to a buyer. The labor groups want preferential treatment of the workers.

III. Production Plans

Nordhoff says he has no fear that the refinancing of Volkswagen will affect his production or expansion plans. But he is understandably secretive about the details of these plans—whether they include a remodeled VW or an entirely new car.

Market experts consider it unlikely that VW will discard its present model in the near future. For one thing, it is selling too well overseas—about 57% of production. And its characteristic shape, ruggedness, and cheap upkeep have helped sales.

• **A New Factory?**—But making a second car probably would mean building a new factory. Besides its plant at Wolfsburg, where passenger cars are made, VW has factories for parts and commercial vehicles in Braunschweig, Hannover, and Kassel, and assembly plants overseas.

Business Week estimates that a brand-new VW would still be two years and about $70-million away once Nordhoff decides to go ahead. Sources close to Wolfsburg, however, believe that VW could come up with a radically new body design using its present chassis in a matter of 90 days after deciding to go ahead. Some say that this may happen early in 1961, after VW has produced its four-millionth car. (*Business Week, Dec.* 5, *p*102)

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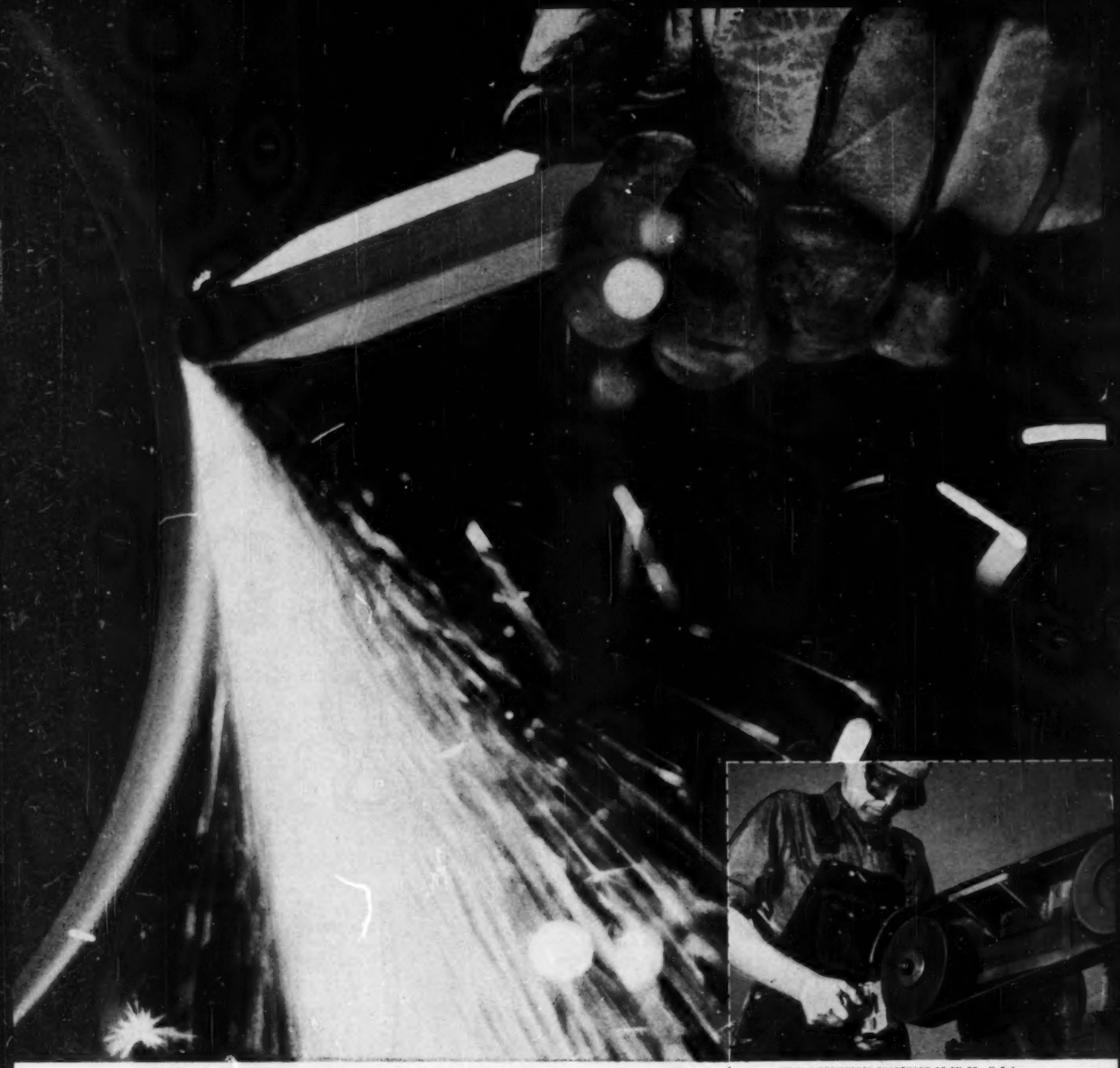

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German Management: A Pattern for the World?

TWO SCHOOLS of thought offer explanations of Germany's economic success. One school explains the nation's vigor, the postwar *Wirtschaftswunder*, as the result of the initiative and talent of individuals like Volkswagen's Heinz Nordhoff (page 27).

The other school does not minimize the contribution of men like Nordhoff. Rather, their interest is different: They seek to explain the Germans' success in terms that are universal, rather than uniquely German, or uniquely individual.

There is not only the individual to consider. Germany's recovery can be partly explained in terms of the backlog of demand, foreign assistance, modernized factories, a population bolstered by refugees eager to get back to work. But this does not completely explain the industrial stability, management's self-assuredness in general, and its position of authority in particular.

• **Universal Conflict**—A provocative answer comes from an American professor, Heinz Hartmann of Princeton University, in a new book called *Authority and Organization in German Management* (Princeton University Press, $6, 1959). According to Hartmann's analysis, German management illustrates a conflict that he considers universal; and the German resolution of that conflict should be of vital interest to managers and entrepreneurs everywhere.

Hartmann says the crucial conflict is between what he calls "functional" values—the practice of management, more or less, and "ultimate" values — management's right to manage. In contrast to the idea of authority based on competence, the German holds his position of authority to be almost a "God-given, inalienable" right. And the same "value" is held by many of the world's managers.

Yet the German has succeeded in creating an efficient industrial organization. Why? According to Hartmann, this may be because his values also inspire personal excellence, and because he had learned to tolerate a good deal of "functionalism" without giving up his position of authority.

• **Key to Organization**—"Ultimate values" are almost always imprecise and hard to define, Hartmann says. There is an element of the irrational about them. But they are the key to management organization. In Germany, the ultimate values are those chiefly associated with the *Unternehmer*—traditionally a term describing the owner-manager, but which now includes top business people in general.

Briefly, three "ultimate values" form the *Unternehmer's* position of authority. Hartmann calls one Natural Law, or the rights of private property; another is the concept of a Calling, which implies something akin to knighthood; the third is the Elite Ideology, which extends the *Unternehmer's* position into society at large.

Hartmann says all three values are now running into the "massive skepticism of some trade unions;" also, the acceptance of the *Unternehmer* as an elite group is limited, even among management groups. But the other two values are widely held by all ranks of Germans, including most workers.

• **Trends** — Hartmann says the emphasis in Germany now is on finding an optimum balance between functional and ultimate values. The owner-entrepreneur is coming to believe "that efficiency can be further expanded without danger to his ultimate authority." And professional managers are showing more interest in the values of the *Unternehmer*, less interest in propagating a concept of authority based on competence alone.

As for management training, Hartmann says that practical education is limited to lower levels of management. Top management meetings, even the three-week seminars at Baden-Baden (which Hartman rates a first-class management center), are devoted to the "concepts and ideologies which go into the making of an *Unternehmer*." ●

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Technology in Brief

Newspapers in Plastic Cases

Mail subscribers to *The New York Times* recently began receiving their big Sunday editions in flat polyethylene bags, instead of in rolled paper wrappers. Magazine publishers have been considering the same practice. The *Times* process is fully mechanized: opened by a puff of air, each transparent envelope is stuffed by lever with a newspaper, then goes on to a heat-sealing mechanism and a machine that attaches a pre-addressed label. Although more expensive than paper wrap, polyethylene makes an attractive package and offers good protection against soiling, tearing, and weather conditions. As a flat package, the newspaper is much easier to handle. (Modern Packaging, Dec, p124)

Giant Water-Electrolysis Plant

Northern India soon will have the world's largest water-electrolysis hydrogen plant. U.S.A.'s Vitro Corp. is building the plant for Nangal Fertilizer and Chemicals Ltd. as part of a $60-million processing complex for synthesizing ammonia, producing nitrophosphate fertilizer, and isolating deuterium. The 25,000-cu.m/hr. hydrogen plant consists of 60 of the world's largest electrolyzers, custom designed by Italy's De Nora company. They will enrich hydrogen in deuterium for feed to a Linde hydrogen-distillation plant. Each electrolyzer is a battery of 100 or more bipolar cells clamped together. (Chemical Engineering, Dec. 14, p88)

Triple-Duty Adhesives

Adhesives now being readied for the market will serve in three ways—as electrical insulators and vibration dampers, as well as improved bonding agents. In airframe construction, properly-engineered layers of new adhesives can provide better vibration protection without adding to size or weight. A U.S. adhesives company demonstrated the new techniques recently in bonding a laminated iron housing to a large magnetic flowmeter. A special epoxy provided a "stronger than metal" bond, while protecting core laminations from vibrations and shorting. (Product Engineering, Dec 7, p40)

System Reduces Exhaust Fumes

A new combustion system, said to cut down auto exhaust hydrocarbon by two-thirds, has been developed by a U.S. inventor, Ralph M. Heintz. The RAM Straticharge Combustion System, as it is called, uses continuous fuel injection and operates on an extremely lean fuel-air mixture. The key to the system is a small precombustion chamber that fits into the engine's spark-plug well. Under light operating loads, fuel and air are pumped only into this small chamber. The spark plug ignites the mixture and it explodes into the main engine cylinder. Under heavy loads, added fuel and air are pumped directly into the cylinder. (Chemical Week, Dec. 5, p69)

Transistors Will Go into TV and F-M

Transistors soon will be used in the front ends of television and frequency-modulation receivers. Delegates to a recent meeting of U.S.A.'s Electronic Industries Association reported that performance of both microalloy diffused and mesa transistors have been improved, and their price is now coming down. Delegates stated that tunnel diodes are in too early development stage to be used in tuner design. (Electronics, Dec. 4, p46)

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What Engine for Future Cars?

The reciprocating engine is being improved—but it faces a determined challenge from turbines, rotating combustion engines, compact diesels, fuel-celled electrics.

THE RECIPROCATING ENGINE that drives the vast majority of today's cars and trucks now faces a challenge from a number of alternative power sources—the gas turbine, the free-piston turbine, fuel cells, improved batteries, compact diesels, a rotating combustion engine.

All of these will be ready for commercial use soon. And experts say that some of them will make a strong place for themselves—unless the gasoline-fueled reciprocating engine can outpace them in redesign and improvements.

• **Basic Needs**—The reciprocating engine had held its own for over 50 years because it gave the motorist what he wanted—a compact power plant that runs efficiently and economically at a wide range of speeds. The present auto engine has great reserves of power for hill-climbing and passing. It speeds up quickly, gets its power at low revolutions per minute, and it can rapidly change speeds from 10 to 150 kilometers an hour. Also, it is small enough to fit into the space available for a car engine.

Any alternative power source must have major assets above and beyond these. It must be cheaper to build, cheaper to operate, and efficient under varying conditions.

The reciprocating piston engine is solidly entrenched. Automakers have been building them in multimillion lots for years. They have learned how to do so economically, and they have a huge capital investment in the machinery dedicated to continuing the practice.

• **Steady Improvements** — The present engines are being constantly improved. Aluminum is taking the place of iron in many engine blocks, making the engine lighter and more resistant to corrosion. Combustion chambers are being redesigned; transistorized ignition is on its way—a step that will eliminate the sometimes troublesome distributor and prolong the working life of spark plugs.

Despite these advantages and promises, many engineers do not believe that the present engine is the ideal power source. They say that it is too big, too bulky, more powerful than needed, and that it burns too much high-priced gasoline. Among alternatives, they believe the gas turbine shows the greatest promise.

1. The Gas Turbine

The gas turbine has appeal because of its small size and simplicity. It is basically a series of fans rotating in a stream of burning gases. It uses only one-fifth as many parts as a reciprocating engine, is practically vibration-free, and uses no cooling system.

Also, gas turbines operate on the cheapest hydrocarbon fuels. With no reciprocating parts, lubrication is cut down to a minimum. Nor is there any problem of tune-up, because the engine's single spark plug is used only for starting.

Two of Detroit's big automakers —General Motors and Chrysler— have been making steady progress in improving their automotive gas turbines. Says George Huebner, Chrysler's project director: "We are close to the time when automotive manufacturers will be able to choose between reciprocating engines or gas turbines."

Chrysler equipped one of its 1959 Plymouths with a gas turbine, and put it through a series of tests under realistic highway speeds and conditions. The car averaged 8.2 kilometers per liter of inexpensive diesel fuel over a test run of 925 kilometers.

General Motors soon will deliver 13 prototype production models of its gas turbine to military and commercial users, for evaluation in trucks and other heavy vehicles. They are being sold for $35,000 each—but GM says they could be mass-produced at a cost comparable with turbo-charged diesels.

• **New Williams Turbine**—Automakers are showing great interest in the recently announced Williams regenerative gas turbine (IMD, Jan, p25), which develops 75 hp from an engine weighing only 34 kilograms. The engine's rotating parts are made of ferrous alloys, but its gear case, compressor, and outer housings are of 50% aluminum alloy die castings. This cuts down both the weight and the overall cost.

The new turbine has been tested for 15 months as an outboard motor on a 5.5-meter boat. It achieves speeds comparable with a reciprocating engine. The U.S. inventor, Sam Williams, says that it can be mass-produced more cheaply than a piston engine. First plans are for an aircraft version of the turbine, though it may eventually go into cars and trucks.

II. Electric Drive

The electric car—powered by improved batteries or fuel cells—is trying to stage a determined comeback. A dozen or more U.S. and European companies have models under development.

But none of these new versions of the electric car have moved into large-scale production. They are held back by financing and marketing problems. Britain has been moving some electrics onto the market, but so far the consumer has not rushed to buy them.

The electric car has the basic advantages of economy (about 80% efficiency from its electric motors), operating simplicity, and low servicing costs. It is clean, because it exhausts no gases or fumes. It has fewer moving parts than a fuel engine, and it accelerates and brakes quickly.

It has its limitations, however. Despite improved batteries, the typical electric car has a top speed of only 65 km per hour—though

some manufacturers hope to improve this—and its batteries must be recharged after 120-130 kilometers. The batteries themselves are still bulky and extremely costly.

• **Fuel-Cell Electrics** — Many people think fuel cells can give electric cars a new lease on life. Fuel cells also turn chemical energy into electricity, but they do not have to be recharged. Their capability was demonstrated recently when Allis-Chalmers of the U.S.A. linked 112 of them together to drive a 20 hp tractor (IMD, Dec. '59, p50).

Experts are divided about the prospects for fuel cells in automobiles. Auto men generally ridicule the idea. But according to *Business Week*, a leading fuel researcher "sees more potential in it than in any other new power system."

The enthusiasm for fuel cells centers upon their efficiency. They convert at least 60% of a hydrocarbon's chemical energy into usable power. But the cells are bulky—and they will have to be brought down in size before they are ready for cars.

III. Diesels—and Others

Auto men are adopting a wait-and-see attitude toward the novel rotating combustion engine now under development by U.S.A.'s Curtiss-Wright and West Germany's NSU Werke (IMD, Jan., p28). According to one automotive engineer, the engine's biggest drawback is that its output per square centimeter of displacement goes down as the engine size increases. Some say that lubrication also may be a problem.

But Curtiss-Wright has announced plans for building these engines within the next 12 months —and putting them into airplanes, cars, trucks, and perhaps even into industrial equipment. And NSU says it will be producing rotating engines for its scooters and small cars sometime in 1961. The West German company has already approached tool makers with designs for the special tools that will be required to form and grind the triangular rotors and complex-shaped combustion chambers that will go into the new engines.

U.S. auto manufacturers continue to show keen interest in another hybrid power source—the free-piston gas turbine—but prototypes to date have not lived up to their promise. This engine uses two pistons that move freely back and forth in a single cylinder. Compressed gases are ignited and led off to drive a turbine.

• **New Jobs for Diesels**—Lightweight, low-cost diesel engines, some of them geared to use gasoline, diesel fuel, kerosene or jet fuel, are being developed in both Europe and the U.S.A. Their aim is to put diesels on the highway as never before—in light trucks and heavy-use cars. Britain's Perkins, West Germany's Daimler-Benz, U.S.A.'s General Motors and Hercules Motor all are trying to sell these diesels for taxicabs in the U.S.A. (In many other nations, where gasoline supplies are short and prices high, diesel cabs have been in use for years.)

Small diesels already are in use —like the 56-hp unit now available on West Germany's 2-ton Hanomag truck—but the emphasis today is on "compact" rather than "small" engines. This means lowering weight-to-power ratios by using less metals, lighter metals, and power-boosting attachments.

In the past, heavy-duty industrial diesels have weighed as much as 36 kg. per hp. Several manufacturers now boast of a 5-to-1 ratio for their compact diesels, and Hercules's latest model is reported to weigh only 2.5 kg per hp. J. I. Case Co, the U.S. farm and industrial tractor manufacturer, has recently introduced a rugged, heavy duty farm tractor diesel that weighs about 4.5 kg per hp (see page 14).

Manufacturers now also are turning out diesels that are less noisy, less smelly, and less expensive. They say their new engines require less maintenance and less fuel than gasoline engines, though they take severe punishment and last much longer.

Says one General Motors executive: "In five years 20% of all taxis on U.S. streets will be diesels." He points out that in a 60,000-km test a diesel taxi operated at about 40% of the cost of a gasoline model, including all repairs and maintenance. (*Business Week, Dec.* 12, p140; *Dec.* 19, *p44*; *Fleet Owner, Dec., p70, p135*; *Purchasing Week, Dec.* 14, *p21*) ●

PRECAST walls and floor slabs were

Apartments

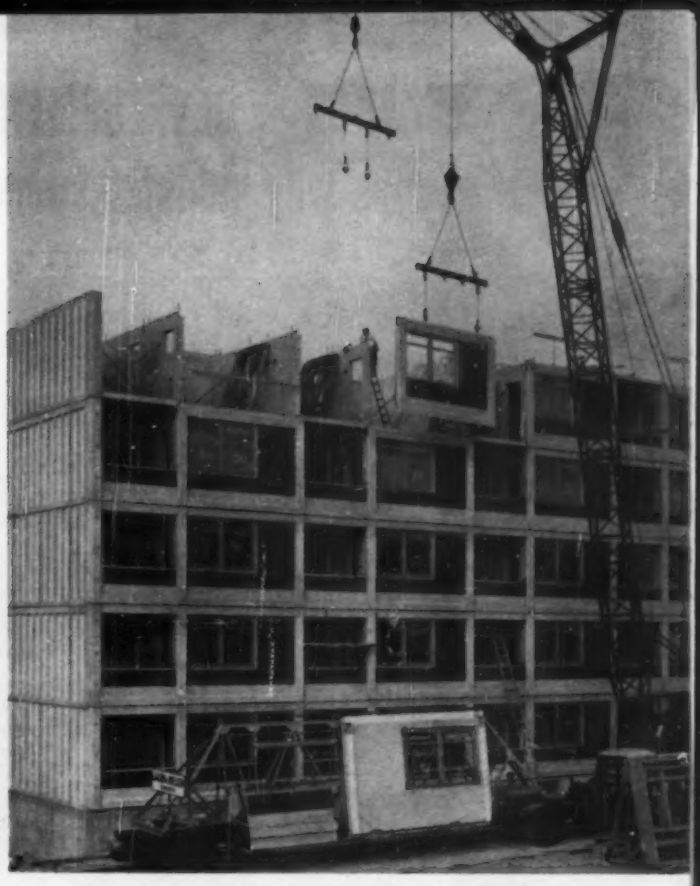
DANISH BUILDERS have developed a highly efficient system of "factory-building" apartment houses.

They began their operations in Copenhagen. But more recently they have turned to export, shipping three-ton pre-cast components 1,000 kilometers away to Hamburg, Germany, and there assembling them on the site into three-room and four-room apartments at the rate of two units a day. In about 22 weeks last summer, 116 prefabricated apartments went into place.

Floor and ceiling slabs for the Hamburg project left the Copenhagen factory complete with all needed horizontal utility lines. Partitions included door frames, doors, all hardware. Exterior walls were shipped with glass and venetian blinds. Pre-cast bathroom units came with all plumbing fixtures in place, ready to be hooked to risers in the building.

Hamburg officials say that the cost of the project—including all freight charges—was materially lower than traditional on-the-site

loaded on railway flatcars in Copenhagen . . .



. . . set in position by crane in Hamburg . . .

Built by Factory Methods

construction. And, even more important, the project was able to go ahead while Hamburg was plagued by a shortage of skilled construction workers. Site assembly of the pre-cast parts required a crew of just 10 men, only three of them skilled (the crane operator and two project supervisors).

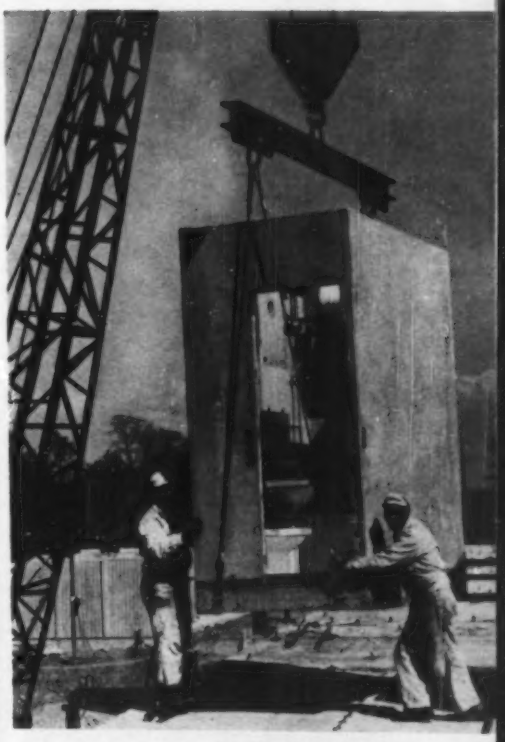
• **Houses Needed Fast**—Hamburg officials turned to this highly-industrialized system of construction because the city's labor shortage was delaying needed housing units. City leaders made a survey of the latest building techniques being used throughout Europe. Their search led them to Larsen & Nielsen Constructors Ltd., a Copenhagen firm that has pioneered in pre-casting for industrial construction since the end of World War II. L&N already was producing and erecting housing projects in Denmark with their prefabricated components.

For the German job, the company was able to take components directly from its regular production runs. Hamburg authorities waived the differences in building codes to speed construction. The Hamburg project is similar to one at Copenhagen—both consist of long, four-story rows of joined apartments—but the individual buildings are smaller. Each housing section consists of 24 three-room and 24 four-room apartments.

• **Tight Schedule**—Once the foundation had been laid down by a local contractor, L&N began moving its components from the Copenhagen factory on a tight transport-erection schedule. Each train of railway wagons carried all the components that were needed for two complete apartment units.

Temporary rail sidings were installed parallel to the site, and rail cranes were able to run the length of the building between the siding and the job. Pre-cast walls, floor slabs, and bathroom units were picked off the flatcars and placed where needed in a single movement, without any double handling.

Exterior walls were assembled



. . . even complete bathroom units with all needed fixtures.

RESEARCH...DEVELOPMENT...RELIABILITY—3 important reasons why industry specifies General Electric equipment

Here, near Bogota, Colombia, General Electric Gas Turbines, with proven reliability, supply the needed power for the Empresa Colombiana de Petroleos' oil well pumping and gasoline plants. This modernized plant includes 2 G-E 5,000 kw gas turbines and other auxiliary equipment. These new facilities have helped this country substantially increase its net dollar earnings.

G-E products provide the dependability you need in everything from complete electrical systems to individual industrial products.

All over the world, General Electric equipment has joined in partnership with *heavy industry* to bring better living to all through industrial expansion.

In Caracas, Venezuela, a General Electric atomic research reactor will be devoted to basic research in the natural sciences. In Norway and other leading shipbuilding nations, products like G-E propulsion units are enabling builders to supply more efficient and reliable ships. In India, General Electric equipment is the backbone of a steel expansion program that will provide more steel for local industry and the government's various development programs.

Exhaustive research, engineering thoroughness and careful pretesting assure optimum performance and minimum maintenance for every type of G-E equipment. Let General Electric assist you now with modernization plans, expansion and your everyday electrical equipment needs. For more information about the G-E equipment to help you in your industry, write: *International General Electric Co., Dept. 70-10, 150 E. 42nd Street, New York 17, N.Y., U.S.A.*

GENERAL ELECTRIC
-U.S.A.-

This 125,000 kw G-E Reheat Turbine-Generator is in service at the Chiba Thermal Power Station of Tokyo Electric Power Co., Inc. The superiority of G-E turbine-generators enables utilities to operate at the lowest heat rates and maintain the highest availability and utilization rates.

A refrigerant leak you can't even see lights up this sensitive new G-E leak detector. Servicemen are more effective, give better service. G.E. has a full line of leak detectors—from portables to supersensitive models.

This thermionic converter produces electricity directly from heat. A product of progressive G-E research, this working model is now being used to discover practical applications for this theory. This is just one more example of why General Electric leads in research for the electrical industry.

from sandwich panels about 17.5 centimeters thick, with polystyrene cores. Similar panels were used for interior bearing walls, and 6-cm. panels for partitions. Floor and ceiling panels were about 17.8 cm. thick and cast with hollow cores.

Components were joint-sealed with foam rubber filling and a thermoplastic calking compound. Only a minimum of finish work had to be done before the apartments were ready for heating. (*Engineering News-Record, Dec. 3, p34*).

Fresh Water by Freezing

A variety of techniques now are spurring progress in turning salt seas into fresh water.

THE WORLD'S first large salt water conversion plant went into operation last year at Aruba, Dutch West Indies—an $11-million plant serving the island's petroleum industry as well as its 55,000 inhabitants. This year will see further progress in the search for economical ways to make salt water fresh.

Two desalting-by-freezing processes are now making news: (1) Carrier Corp. has begun test runs of a pilot plant built as part of the U. S. Government's program for investigating various desalting methods; (2) another American company, Fairbanks, Morse & Co., has announced plans for a joint venture with Israel's Ministry of Development to build plants using the Alexander Zarchin process.

• **Water by Freezing**—Desalting water by freezing consists basically of forming pure-water ice crystals by lowering the water's temperature, then segregating the crystals from the salt trapped between them. The process is said to require less energy than distillation methods, and to minimize scale and corrosion.

The Carrier pilot plant, with a capacity of 57,000 liters per day, is the first to make sea water drinkable through the freezing process. The pilot installation is being tested at the company's headquarters in New York state, but early this year will be moved to the ocean shore for more extensive trials.

• **Zarchin Process** — Fairbanks, Morse predicts that it will be able to produce fresh water by the Zarchin freezing process at a cost of about 10¢ per liter—a cost comparable to drilling from wells. The process was developed by Dr. Alexander Zarchin, working with Israel's Ministry of Development, and has been steadily improved.

In joining with Israeli authorities, Fairbanks, Morse believes it is launching a commercially-sound program that "will increase agricultural output and bring a better life to millions of people in many countries." The U. S. company—a manufacturer of large water pumps—hopes to build plants in several countries, and suggests that it could build a total world capacity of 4,000-million liters per day by 1966.

The first effort will be a 1.9-million liter unit to be built in Israel during the coming year. This will be followed by a plant in southwestern U.S.A. Several other countries, including Ceylon, Greece, and India, also have expressed interest in the Zarchin process.

• **Distillation Processes**—Distillation is the most common method of desalting water, and steady advances are being made in the efficiency of various distillation processes. Distillation units are in use in Gibraltar, Ecuador, Bermuda, Kuwait, Curacao, and Peru. A 3.8-million-liter-per-day plant is now being built for the Bahamas.

Aruba's new plant is almost three times this size—with capacity for supplying over 10-million liters of fresh water per day. The plant employs the submerged-coil, multiple-effect distillation process, in which hot vapor from each effect gives up its latent heat to help evaporate water in the next effect. Special equipment has been installed to prevent salts in the concentrated brine from forming deposits on tank and tube surfaces.

An outstanding feature of the Aruba plant is that it combines salt water distillation with the production of marketable electricity. Turbogenerators take steam from the process to supply 15,000 kw of electricity. ●

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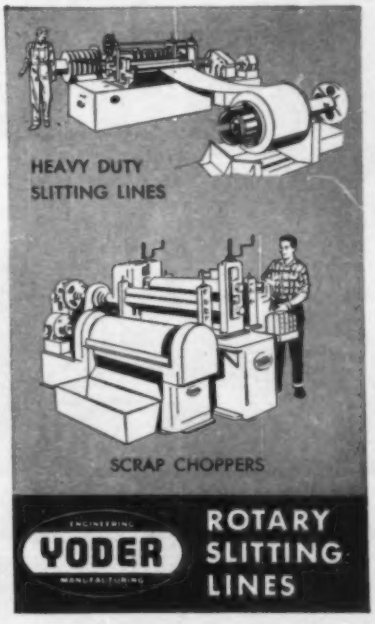

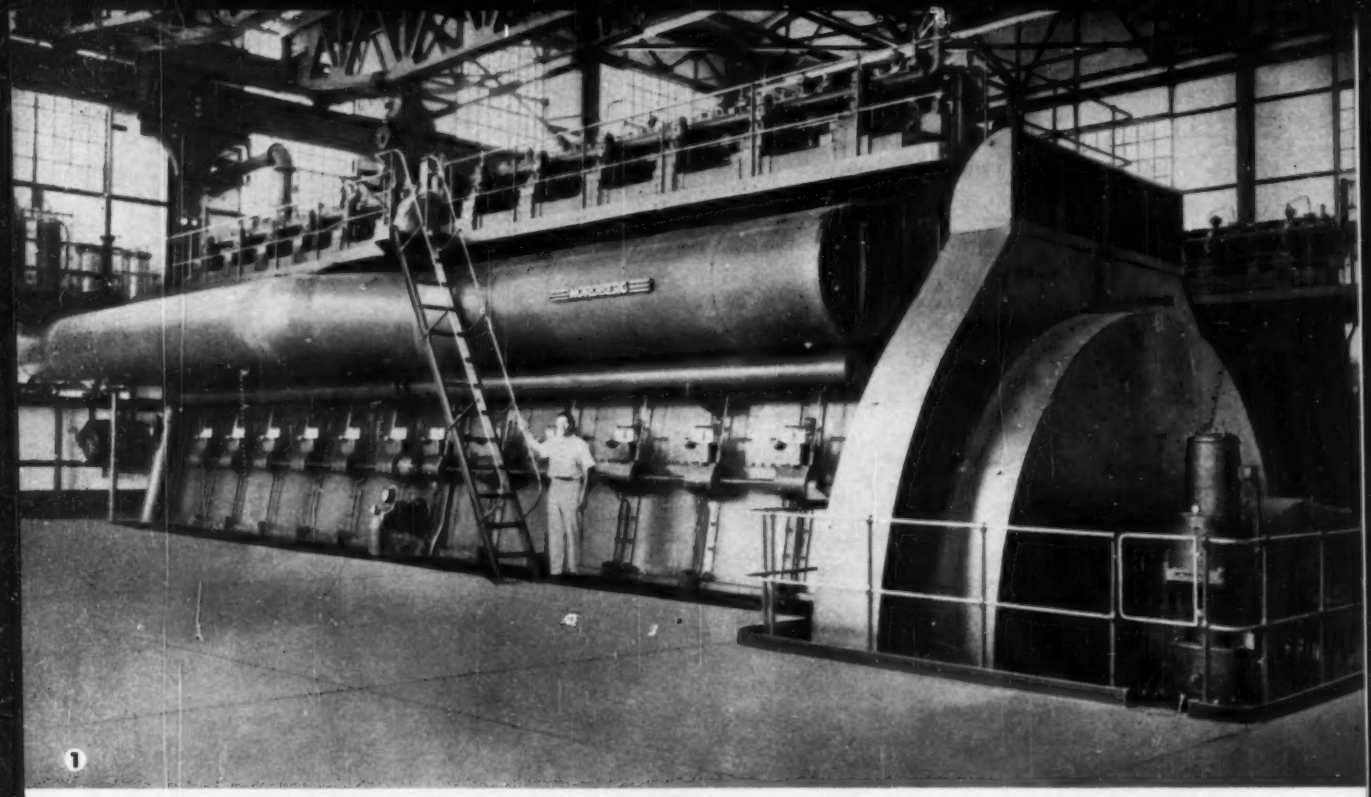

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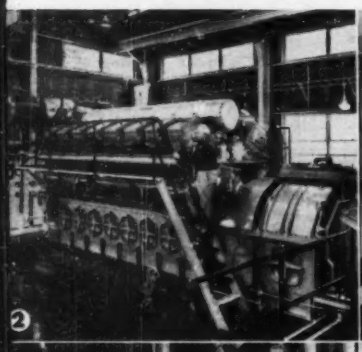

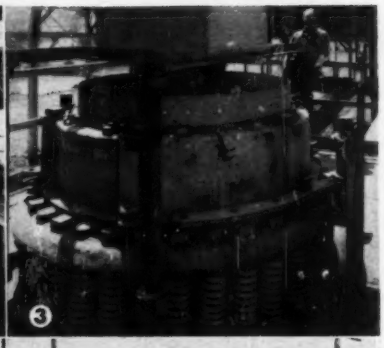

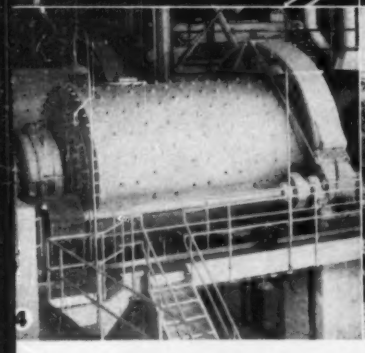

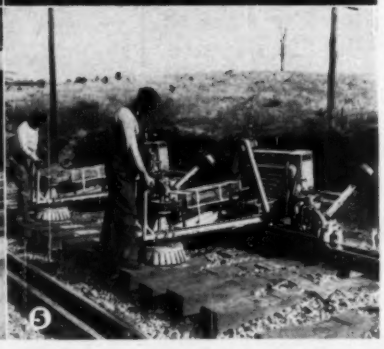

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Users Can Turn to Steelmaking

MANY MORE small steel companies may appear—and some steel consumers may find it profitable to make their own steel—as a result of a new process that will graduate to commercial status later this year.

For three years, the Strategic-Udy process has been tested in a Canadian pilot plant. Now the newly-formed Quebec South Shore Steel Corp. has contracted to build a $22-million, 120,000-ton-per-year plant at Varennes, Canada.

The advantage of the S-U process is that it is economical on a small scale. Coal is used rather than coke, and a rotary kiln takes the place of the stack in the blast furnace, or the bed of solids in conventional electric smelters.

"Basically, the Strategic-Udy process is still the same as the old blast furnace. We've just chopped off the stack and turned it on its side," says Frank Senior, manager of the pilot plant.

• **No Mass**—By doing so, no coke is needed to support a towering mass of limestone and ore. Coal can serve as well as coke as the reducing agent.

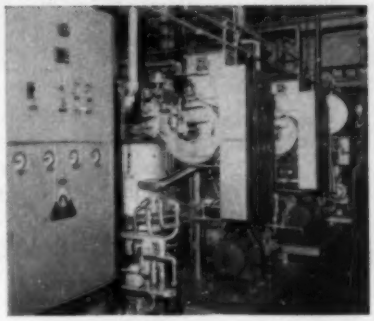
And by removing this burden, a semi-steel with little carbon content can be produced. In blast furnaces and electric smelters lumps of coke are forced down into the molten metal, increasing the iron's carbon —and the cost of refining.

The new S-U plant probably will be as expensive to operate as a blast furnace, despite the economies of reducing cheap ore and the use of coal rather than coke. The use of electricity increases cost, and the S-U process will not yield the revenues that a blast furnace gets from coal tar by-products.

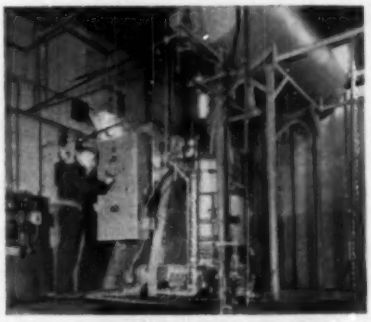
• **Installation Savings**—The big savings will be in installation—estimated at about 40% less than the cost of a comparable blast furnace —and in the decreased expense of converting semi-steel into steel.

Experts see the Varennes plant as setting a trend for small companies to produce relatively minor quantities of steel. If the S-U process proves competitive, big steelmakers may use it for expansions. (*Chemical Week, Dec. 26, p34*)

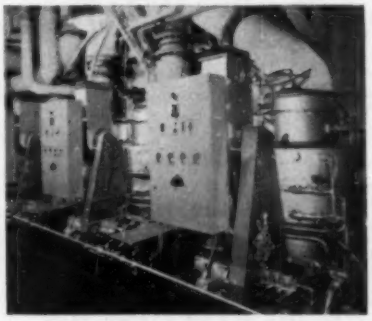
LOW COST STEAM



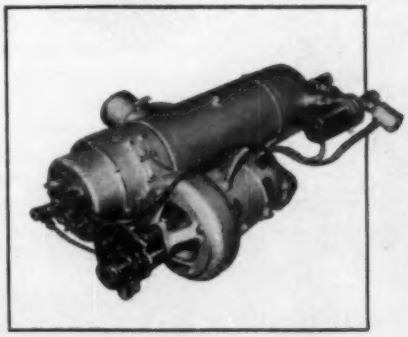
* Vapor Steam Generators in new manufacturing plant boiler room will save about $30,000 per year.



* Canning factory reduced costs and increased production with a Vapor installation.



* Compact, clean installation on Canadian tanker producing 17,000 lbs. of steam an hour.



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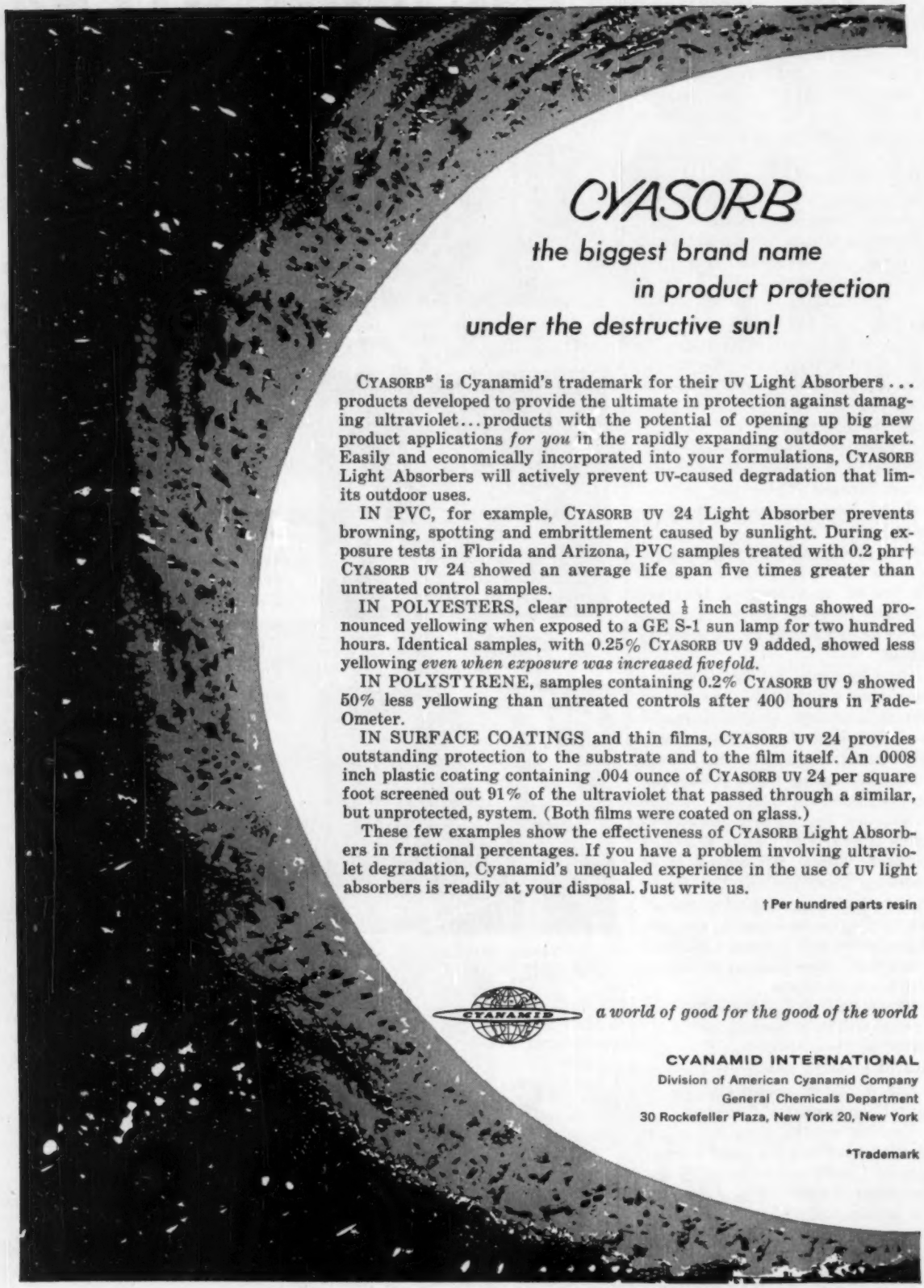

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CYASORB* is Cyanamid's trademark for their UV Light Absorbers . . . products developed to provide the ultimate in protection against damaging ultraviolet... products with the potential of opening up big new product applications *for you* in the rapidly expanding outdoor market. Easily and economically incorporated into your formulations, CYASORB Light Absorbers will actively prevent UV-caused degradation that limits outdoor uses.

IN PVC, for example, CYASORB UV 24 Light Absorber prevents browning, spotting and embrittlement caused by sunlight. During exposure tests in Florida and Arizona, PVC samples treated with 0.2 phr† CYASORB UV 24 showed an average life span five times greater than untreated control samples.

IN POLYESTERS, clear unprotected $\frac{1}{8}$ inch castings showed pronounced yellowing when exposed to a GE S-1 sun lamp for two hundred hours. Identical samples, with 0.25% CYASORB UV 9 added, showed less yellowing *even when exposure was increased fivefold.*

IN POLYSTYRENE, samples containing 0.2% CYASORB UV 9 showed 50% less yellowing than untreated controls after 400 hours in Fade-Ometer.

IN SURFACE COATINGS and thin films, CYASORB UV 24 provides outstanding protection to the substrate and to the film itself. An .0008 inch plastic coating containing .004 ounce of CYASORB UV 24 per square foot screened out 91% of the ultraviolet that passed through a similar, but unprotected, system. (Both films were coated on glass.)

These few examples show the effectiveness of CYASORB Light Absorbers in fractional percentages. If you have a problem involving ultraviolet degradation, Cyanamid's unequaled experience in the use of UV light absorbers is readily at your disposal. Just write us.

†Per hundred parts resin

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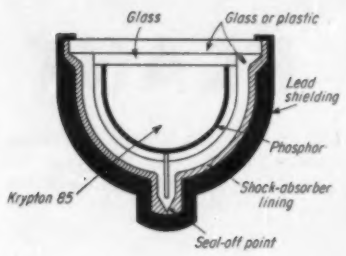


"10-Year Light Bulb" Needs No Outside Power Source

A long-lasting radioisotope lamp developed at Britain's Atomic Energy Research Establishment is now in commercial production. Its light output is not great compared to conventional bulbs, but a 20-cm. bulb can reportedly be seen from a distance of about ¾-km. The lamp—which uses Krypton 85—provides light in a number of colors.

Also available are arrows and luminous strips in various sizes, and "torches" 7.5 cm in diameter and 25 cm long. Initial costs are high, but the light is reported to last for years. *Brandhurst Co. Ltd., Vintry House, Queens St. Place, London EC4, England.*

Vacuum-Packs Small Parts

A vacuum sealing machine has come on the market for packaging a variety of small items—small instruments, machined parts, electrical and radio components. The parts are first inserted by hand into pouches made from plastics film. The pouches are then exhausted and sealed under high vacuum at speeds up to 660 per hour. The machine requires one unskilled operator. Packaging by this means is said to be cheaper than with fully automatic equipment. *M. L. Shelley & Ptnrs, 213-215 Upper St., London N.1., England.*

Better Precision Tooling

A new tape-controlled contouring machine promises to set new standards for automatic precision. Ex-Cell-O's Numera-Trol 922 can be moved—either electronically or manually—in increments of about a half a micron.

The Numera-Trol 922 is operated at 22 C in a temperature-controlled room. The hydraulic power unit is water-cooled, and heat from the electronic equipment needed for tap control is ducted away from the work area, thus making it possible to hold work tolerances of 2.5 microns in routine production of templates and 5 microns in contour boring and turning. The cost: about $230,000. *Ex-Cell-O Corp., Box 386, Roosevelt Park Annex, Detroit 32, Mich., U.S.A.*

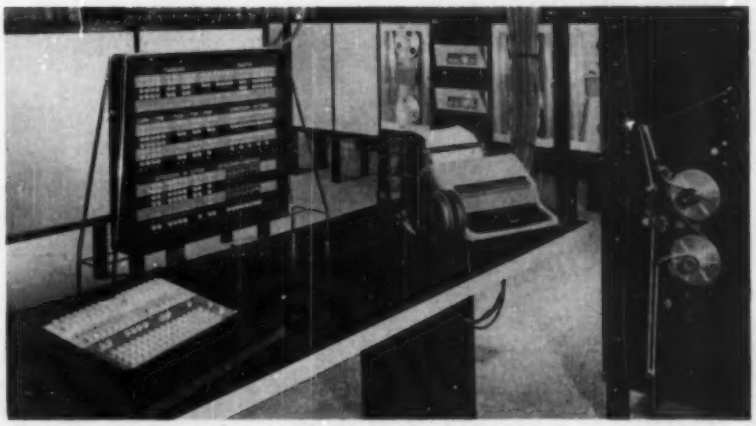
Lightweight Welding Gun

New equipment, called Sigmette, has been developed for rapid, semi-automatic welding of thin ferrous and non-ferrous materials. Weighing just over 1.35 kg, the gun carries within itself a spool of either aluminum or ferrous wire. Shielding is by argon gas or carbon dioxide. Welding is done by the "short a-c" method in which the metal transfer is in globular form, as distinct from the spray-type method. *Quasi Arc Ltd., Bilston, Staffs., England.*

Automatic Bander Tapes Bulky Items

A pneumatically-powered, electronically-controlled machine is now available to handle fast and reliable bundling of bulky merchandise. Especially suited to lumber bundling, the bander uses tape of widths from about 1 to 2½ cm., and can tape objects from 5 to 30 cm. in height and width and any length of 30 cm or more.

Production rate varies depending on size of product handled and number of wraps per product. Maximum application rate is six per minute. Similar machines can and will be built to varying specifications to meet other banding requirements. *Minnesota Mining & Mfg. Co., Intl. Div., 900 Bush Avenue, St. Paul 6, Minn., U.S.A.*



From Olivetti: First All-Italian Computer

An attraction at the Milan Automation and Instrumentation Show was Olivetti's new Elea 9003—the first fully-transistorized computer entirely made in Italy.

Equipped with an automatic priority system, the Elea can phase in three programs simultaneously without interruption. An internal memory unit for retaining program instructions and storing information has a capacity of 160,000 characters, and can be enlarged by adding magnetic drum memories.

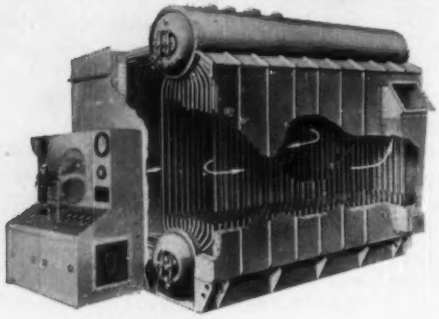
Input information can enter the computer via punched tape, punched card or magnetic tape. Results are recorded on teletype or punched cards. Off-line equipment can convert punched tape or cards to magnetic tape, thus retaining information for processing at a later date. Its photoelectric reader handles 800 characters per second or 700 cards per minute. A fast teletype—also offline equipment — gives speeds varying between 600 to 800 lines, 120 symbols each, a minute. *Olivetti & C. S.p.A., Ufficio Contabilita Fornitori, Ivrea (Torino), Italy.*

One of these C-E standard boilers is...

DESIGNED FOR YOUR PLANT

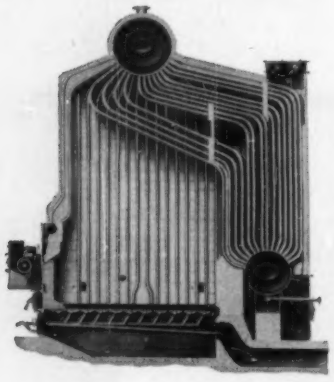
If your steam needs range between 4,000 and 140,000 pounds per hour, one of these versatile C-E Boilers will give you economical, standout performance. For while they are standard in design (which means lower first cost and proven performance), they're still *flexible* enough to be easily adapted to meet almost any standard requirement.

Chances are that one of the C-E standard boilers is the answer to your steam needs. But whatever they may be, C-E can fill them. For C-E Boilers are made in sizes and types for *any* capacity—for *any* pressure—*any* fuel or method of firing.



C-E Package Boiler, Type VP

This completely shop-assembled boiler is available in fourteen sizes from 4,000 to 90,000 pounds of steam per hour . . . for operating pressures up to 700 psi . . . temperatures to 750 F . . . for pressure firing of liquid or gaseous fuels. The VP Boiler has more water-cooled area per cubic foot of furnace volume than any other boiler of its size and type. The large lower drum—30-inch diameter—permits a simple, symmetrical tube arrangement . . . greater water storage capacity . . . easy access for washing down or inspection. A centrifugal fan, which operates at low speed and is exceptionally quiet in operation, is standard equipment. The simple baffle arrangement results in low draft loss . . . simple soot blowing . . . no dead pockets . . . high heat absorption. The VP is enclosed in a reinforced gas-tight, welded steel casing, and shipped completely assembled with firing equipment, fittings and forced draft fan. For foundation, it needs only a simple concrete slab.

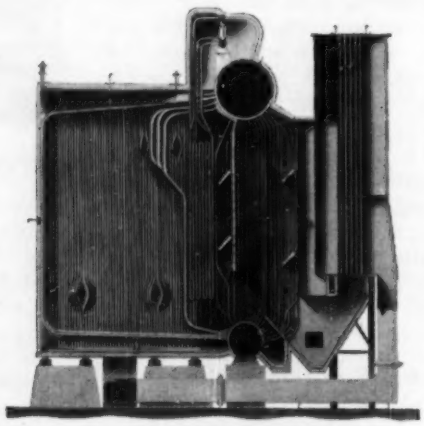


C-E Vertical Unit Boiler, Type VU-10

The VU-10 is available in nine sizes from 10,000 to 60,000 pounds of steam per hour . . . for operating pressures up to 475 psi . . . superheat to 150 F in 20,000-60,000 lb range . . . for solid, liquid or gaseous fuels. This boiler is a completely standardized design adaptable to many conditions. It is bottom-supported and needs no outside supporting steel. It operates efficiently over a wide range of output and is easy to operate and maintain. All parts are easily accessible for inspection. The VU-10 is a complete unit—boiler, furnace, setting, fuel-burning equipment, controls, forced draft, heat-recovery equipment (if desired). Regardless of fuel, the same general cross-sectional arrangement of drums, convection bank and furnace wall cooling is used. Uniform design through each transverse section assures even water level in the drum and uniform expansion.

C-E Vertical Unit Boiler, Type VU-55

The VU-55 Boiler is available in five sizes ranging from 70,000 to 140,000 pounds of steam per hour. It is designed for pressures from 250 to 750 psi for all sizes and for up to 300 degrees F of superheat. Heat-recovery equipment may be added if desired. VU-55 Boilers are designed for the pressure firing of oil or gaseous fuel and require no induced draft fan. They are equipped with tangential burners and tangent furnace tubes to assure a level of performance which compares favorably with modern utility practice. Equipped with a large (60-in) steam drum, the VU-55 has generous water capacity and steam reservoir space. C-E drum internals assure high quality steam at all ratings. The absence of outside downcomer tubes and ducts makes possible the attractive streamlined exterior of the VU-55.



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TAPE READERS permit more than 2,500 programming instructions at any one time in new electronic computer.

Visible Record Computer "Reads and Writes"

A solid-state electronic computer data processing system has been developed capable of reading and writing the same language as the human eye can read.

The B251 Visible Record Computer was specifically designed to meet the needs of the banking industry. It reads information directly from checks, deposit slips, and other documents of varying sizes and thicknesses; it processes the information and automatically computes, selects and posts directly to the correct customer's account record.

The initial cost of the system is low compared to other automatic data-processing systems. Specially-built rooms, air-conditioning and humidity controls required for many computers are unnecessary.

One person can operate the computer, which is capable of performing 4,000 arithmetical functions a minute. *Burroughs Corp., Detroit 32, Mich., U.S.A.*

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A simple-to-use, direct-reading ultrasonic gage tells at a glance the exact (to 1% of full-scale accuracy) thickness of metals, plastics, and liquids, spots corrosion or flaws in pipes and storage vessels, and detects laminations or stringers in welding plate. *Sperry Products, Inc.,* 1000 *Shelter Rock Road, Danbury, Conn., U.S.A.*

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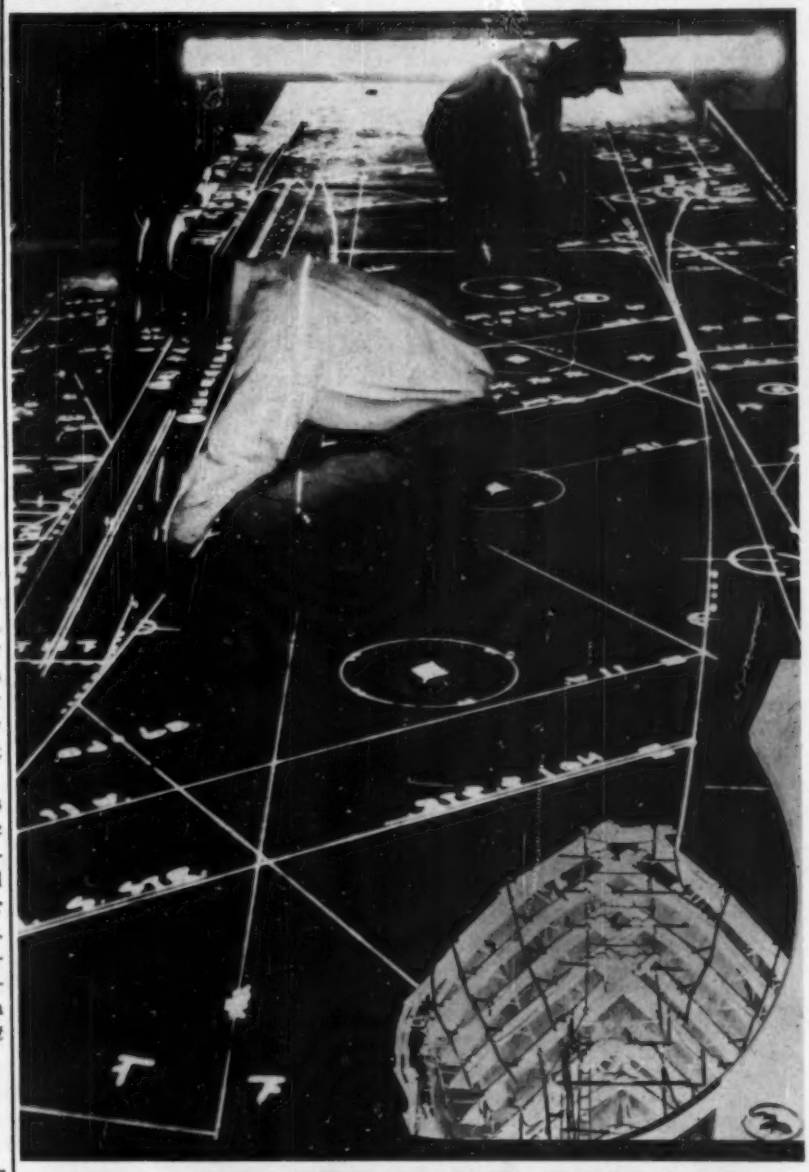

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A new survey of 162 U. S. industrial plants sheds light on all major plant practices and operating procedures. Here is valuable data on . . .

How Plants Are Managed Today

"NOW WE REALLY KNOW what is going on in our plant," commented a reader of *Factory* after finishing the magazine's 14-page questionnaire on plant practices. And *Factory* says every manager would benefit from carrying out such a "systematic audit." For comparisons, he can check the highlights from this survey of 162 U. S. plants.

The top problem today, according to the survey, is controlling costs, followed in descending order by communications (getting people to understand what is wanted and needed), maintaining quality, meeting production goals, motivating people (getting them to do what they are supposed to do), union relations, and organization.

Where a breakdown was found useful, the survey was analyzed by size of plant and for five types of industry: heavy process (steel, chemicals, etc.), light process (food, paint, glass products), heavy fabrication (autos, machine tools), light fabrication (paper products, footwear), and benchwork (electronics, business machines).

Here are the highlights:

• **Controlling Costs**—Productivity failed to gain last year in over 25% of the American plants surveyed, and it actually declined in 6%. No doubt this is why cost control is rated today's No. 1 problem.

In controlling costs, the trend is to standard cost systems. Over half of the smaller plants (under 250 employees) use standard costs. Variable budgets are used in about half of all the plants.

Monthly cost reporting is the rule, but daily reports are not unusual for direct, indirect, and overtime labor.

A surprising 29% of the plants have incentive plans for management, averaging 13% extra pay. Slightly under half have organized work simplification programs; 41% have suggestion systems.

• **Quality Control** — Statistical quality control is used in over half the plants, primarily for purchased materials, product processing, and finished products. Almost a third of the plants that use "SQC" have a quality-rating system for their suppliers.

Over a third of the plants inspect less than 10% of output. But piece inspection is still important. Half the benchwork plants inspect over 90% of output, and a quarter of the fabricating plants inspect over 90%.

The cost of quality control varies. Here are some averages: light processing, 5.9% of plant costs; heavy processing, 3.7%; heavy fabrication, 4.8%; light fabrication, 3.5%; benchwork, 4.8%.

• **Materials Handling**—*Factory's* editors call the cost estimates "conservative" (see chart). But it is well to note that the range is wide. Handling costs run below 5% in over half of heavy processing and light fabricating plants, almost half of benchwork plants, and a fifth of light processing and heavy fabricating plants. Handling costs run over 20% for a third of light processing plants, 12% of heavy processing, 11% of heavy processing, and 4% of light fabrication; none of the benchwork plants report handling costs above 20%.

Materials-handling labor generally falls in the range of 3% to 10% of total manpower.

• **Production & Inventory Control**—Control costs average 3.5% of total plant costs, with a range from 1% to 20%. Two-thirds of all plants, and 90% of the small plants, assign both control to one man.

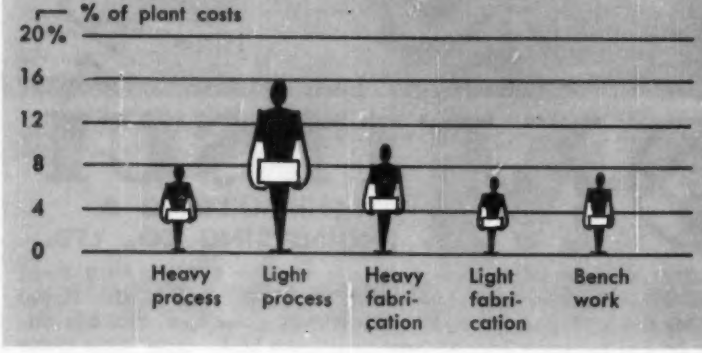
Here are the inventory turnover rates for the industry types: Purchased materials: benchwork, 14 times a year; process, 12 times; fabrication, 8. Work in process: processing plants, 25 times a year; fabrication, 14; benchwork, 14. Finished goods: heavy process, 21 times a year; light process, 15; heavy fabrication, 14; light fabrication, 11; benchwork, 8.

Besides these highlights, the survey provided answers to a variety of specific questions on practices.

How much may managers spend without approval from above? Using figures that hold for 75% of the plants, *Factory* says in small and medium-sized plants the plant manager can authorize expenditures up to $2,500; department heads can

HIDDEN MATERIALS HANDLING COSTS?

Handling costs are usually estimated at 20% to 25% of total plant costs. But averages in this survey ran only half as much. The breakdown:



approve up to $1,000; first-line supervisors, up to $500. For large plants, the figures increase to $10,000 for plant managers and $2,500 for department heads, with the same $500 figure holding for first-line supervisors.

How are plants organized? There is little pattern; note that organization was rated low as a problem. Suggestion systems, for instance, are operated by the personnel department in 53% of the plants, by industrial engineering in 18%, committees in 13%, line managers in 12%. Responsibility for other programs is just as diverse.

Are new problem-solving techniques being used? A surprising 19% of all plants—and 10% of plants with under 250 employees—say they use mathematical techniques. Operations research applications include inventory control, production scheduling, materials and product flow, machinery life and replacement, machine utilization, and paperwork flow.

Nearly half (48%) make formal studies to determine whether to make or buy components. A lesser number (36%) use value analysis to challenge the costs of materials and parts. All industries seem to use both techniques about equally.

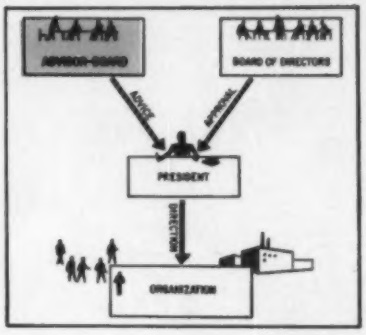
Is work sampling being used? Although a relatively new technique (similar in nature to public opinion polling), work sampling is used in 47% of the plants—67% of large plants, 27% of small plants. Benchwork industries lead in its use. Leading applications: employee workloads, equipment utilization, quality control, time standards.

Is there much manufacturing research going on? Another surprise: 34% of the plants say they have "a laboratory used exclusively for research in production processes, methods, or materials." No industry type predominated, though the labs are found more commonly among the large plants (53%).

How many workers does a supervisor supervise? The number varies widely. The maximum for 75% of the plants is an average of 25 in heavy process industries, 40 in light processing, 20 in heavy fabrication, 30 in light fabrication, and over 40 in benchwork. Averages run about the same for production and non-production work. (*Factory, Dec., p* 50)

"Star Chamber" for Presidents

Sole function of advisory board is to criticize.



AT THE FIRST MEETING of the pioneering Advisor-Board (right), the president of the U.S.A.'s Smithcraft Corp., a medium-sized manufacturer of lighting fixtures, told the four members: "The only reason for your existence is to provide me with objective, informed, and competent criticism."

After eight sessions with this self-imposed "Star Chamber," President Louis E. Newman summed up his experience in the *Harvard Business Review* (Nov.-Dec., p65). The advisor-board, he says, has been a major factor in stimulating cost reduction at Smithcraft; it has been a source of advice on the economic outlook, and a sounding board on important personnel matters. Newman adds that the board's occasional approval of his actions has given him confidence in his decisions.

• **Needed Advice**—Newman himself is a professional manager, responsible to a Board of Directors whose chairman is the effective owner of the corporation. He felt a need for a "mechanism" that would supply him with advice and criticism, but would not restrict his power over company affairs, or the owner's ultimate control over him.

He considered, then rejected, a plan to enlarge the company's board of directors—an "inside" board—to include perhaps a banker, a university professor, representatives of an important supplier and customer. These men would bring "valuable viewpoints" to the company, he decided, but what he really needed—as president—was professional, confidential counsel.

• **Consultant's Role**—With his needs defined, Newman turned over the problem to a management consultant, H. B. Maynard & Co. of Pittsburgh. Dr. H. B. Maynard, head of the firm, agreed to serve on an advisory board, and to locate high-caliber candidates to serve with him.

Newman then decided to go one step further. To avoid possibly delicate personnel problems, and to insure the board's complete objectivity, he asked that the advisory board be responsible to the consulting firm, rather than to Smithcraft.

From this beginning, Maynard has continued to develop the idea of the advisory board into a regular consulting service (the term Advisor-Board is the copyrighted property of the Maynard firm). Later applications have followed the pattern established at Smithcraft.

Newman and Maynard agreed that the advisors should be paid the going rate for management consultants (though Maynard is the only practicing consultant on the board) with the company paying a single bill to the consulting firm.

Maynard supplied data on 25 men; then Newman made the final selection. He picked men with broad general management experience. But each also qualified as a specialist in one of four fields: manufacturing, plant management, marketing, and finance. And each was chosen from different geographical areas, to widen the board's business outlook. Maynard's firm prepared reports on Smithcraft for the advisors to study.

• **Numbers Game** — Newman wanted the smallest number of advisors practical—for the obvious reason to keep costs within bounds. But he and Maynard agreed that four would be better than three. Since the members were expected to take strong positions, and to exert persuasion on the president, Newman felt that a 2-2 or 3-1 split on controversial questions would be more desirable than a 2-1 split.

With meetings held at two month intervals, cost for the first year's operation of the pioneering Advisor-Board totaled about $12,000. ●

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U.S. Looks at Licensing

Interest grows, but understanding lags. Here is the latest on licensing objectives and payments.

DESPITE increasing interest in international licensing, it is still not widely understood as a technique for expanding world markets. Direct export and overseas manufacturing investment seem more deeply rooted in U. S. business thinking.

This is the opinion of a leading American researcher in the field of licensing, Professor J. N. Behrman of the University of Delaware. But he believes this attitude will change. Licensing is still a logical "middle" approach to foreign markets, especially for smaller companies.

• **Objectives**—After a thorough study of American licensing practices and objectives, Behrman is convinced the primary goal of U. S. licensors is to get their products produced — to expand markets rather than restrict them. He hopes soon to more closely study the present practices of European licensors. In past decades, Behrman believes, the prime European objective in licensing was to divide and restrict markets rather than expand them.

Licensing still follows trade rather than precedes it, Behrman says. The bulk of licensing is done between the industrialized countries, though it is becoming important in the developing nations.

Licensing has been particularly popular in fields such as pharmaceutical and household-appliance manufacture. There is also much activity in machinery that is "difficult to move" because of import restrictions, transportation costs, limited markets, etc.

• **More Participation** — Equity participation in the licensee company is now the acknowledged goal of many licensors. But Behrman emphasizes that equity participation is not yet the only way to go about licensing. Many companies still believe in simple royalty arrangements, though some of them will also accept equity participation as a secondary goal.

Again, mark the difference between licenses a firm will grant to one of its affiliates and those granted to independent companies: Of all the foreign licenses issued by American manufacturers, fully 40% are to affiliated companies.

• **Payments** — Behrman sees a trend to "broadly lower" royalty rates, but not because of any general philosophy to cut rates. In many countries, licensing agreements must meet the approval of the government and its foreign exchange authorities, and Behrman attributes the lower rates to "governmental pressures and competition."

The "rule of thumb" for royalty payments among U. S. license negotiators is still 5% of net sales. And while 5% is the average royalty rate, Behrman has noticed agreements calling for from a quarter of one percent to 30% of net sales.

There are other points, too.

Variations and combinations of payment (lump payments, pay-

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the scientific, technical and mechanical approach to the problems of Industrial Floor Maintenance that has produced remarkable results.

Photograph by courtesy of OSLO LYSVERKER Oslo, Norway.

Here is a current example:
The offices of the OSLO Electricity Supply Company cover 10,000 square metres. Until recently the linoleum covered floors were cleaned with soap and water by a staff of 45 women—but results were not satisfactory. Five Cimex 'Vultures' and one 'Dipper' were purchased and Cimex cleaning methods introduced. The floors are now scrubbed only once a year, but are polished with 'Vultures' twice a week and cleaned daily with a damp mop to remove dust and scuff marks, emulsion wax being applied only when necessary. The cleaning staff has now been reduced to 22 women each of whom spends only 3 hours a day on the floors. The results of the first year's work are impressive—a saving of £4,250, the appearance of the floors first-class, while the work is easier and the cleaning staff happier.

The above case is typical of the results obtained by Cimex equipment used in conjunction with Cimex cleaning methods and is happening in factories, offices, stores, hospitals etc. throughout the world.

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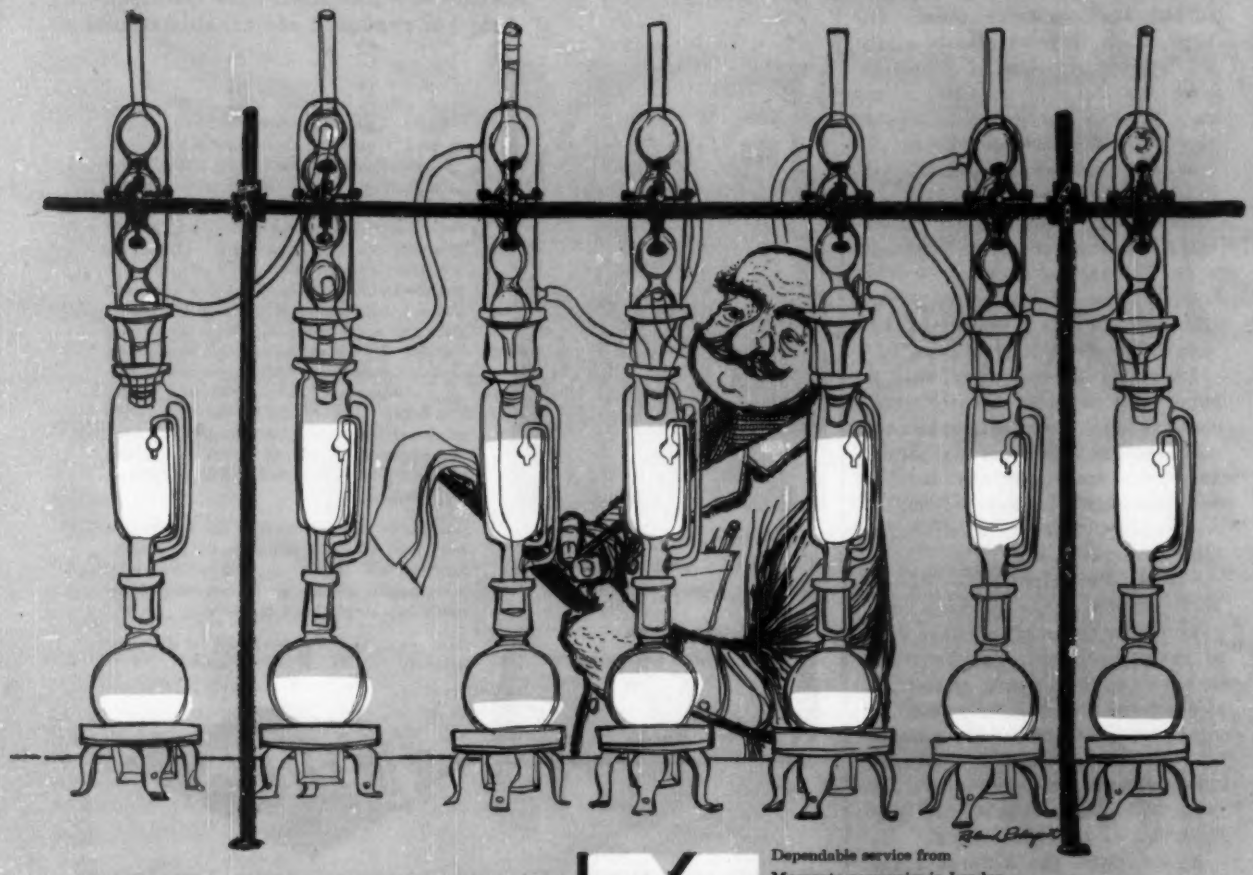

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Dependable service from Monsanto companies in London, Paris, Tokyo, Melbourne, Montreal, Bombay, Mexico, D.F., Buenos Aires and from sales representatives in all principal cities of the world.

Where Creative Chemistry Works Wonders for You

ments for services, etc.), plus intangible factors, make bare percentage figures relatively meaningless. Licensors also benefit from sales of component parts, raw materials, and complimentary items.

Flexible royalty rates are gaining favor as an incentive for the licensee to do his best. Sliding scales are based on a period or production basis; in some cases, the licensee has an option of a yearly scale or a sliding scale extending over the license period.

• **Negotiations**—Picking a good partner is the best answer to many of the problems of licensing. Behrman says the reason is not just the likelihood of poor performance from the bad partner. In many cases, agreements are unworkable in the first place, or they do not work out as planned. And it takes a good partnership to resolve an imperfect agreement.

To companies entering licensing for the first time, Behrman strongly advocates the services of a legal consultant. Licensing agreements are usually negotiated as a "package," he notes, with each provision bargainable against the others. It takes a skilled negotiator to know when to "give" on one provision to "get" on another.

Behrman says the toughest bargaining point for U.S. negotiators is the question of exclusive rights (sales territories, for instance). Even here, they usually must "give to get." Some of the largest corporations offer standard contracts on a "take it or leave it" basis; but these are the exception. ●

Solstrand Graduates Prove Their Mettle

"A NORWEGIAN Contribution to Management Development" is the long-awaited report on the top-management training program of the Norwegian School of Economics & Business Administration—the "Solstrand program" (IMD, Sept.).

The report concludes that the main advantage gained from the training experience has been a critical increase in self confidence. Furthermore, the students have had a definite and positive influence on their companies. The report was written by Professor E. Wight Bakke of Yale University.

Bakke found among Solstrand graduates convincing evidence of increased delegation of authority, more respect for the authority of lower-level supervisors, and more interest in every aspect of their businesses. He cites their periodic group conferences, new job descriptions, and formal control systems with written reports.

• **Learn by Doing**—The Solstrand program combines the "case" method used at Harvard University and the "syndicate" method used at Britain's Administrative Staff College. Emphasis is on the students learning from "doing" rather than listening to lectures. The course is broken into two sessions, five weeks in spring, six weeks in fall.

Each student participates in 16 or 17 group projects—concerned with problems of the Norwegian company, business in general, and society—each requiring 5 to 13 meetings. Each man serves as group chairman for two projects, always subjects outside his specialty. A personnel man, for instance, might be chairman of a group working on problems of Europe's Common Market. Thus, says Bakke of a graduate, "he had to depend on the ideas of others to develop a report he had to defend. He had to listen. He had to evaluate and decide which suggestions were worth following up. He had to fit many diverse ideas into an organized whole."

• **Learn From Each Other**—In addition, about 40 case studies are dealt with, all based on concrete Norwegian business situations. Many of the cases are illustrated by "role playing" (acting out the situation). The aim is for the students to learn from each other; as one points out, each class represents 600 years of business experience.

How learning takes place was described by one graduate: "One of the things I learned at Solstrand, and I do not know how I learned it, was the necessity for controls . . . I do not think we had any specific discussion of controls as a subject . . . but it certainly was a big factor in a lot of the cases we discussed." ●

Britain's MRG Stays Small

IN THIS AGE OF EXPANSION, management associations have been growing as fast as their more aggressive member firms. One notable exception is Britain's Management Research Groups, which has a total membership of 80 small and medium-sized companies. And the *Financial Times* of London recently reported a strong feeling among members that their organization was big enough.

Perhaps the MRG will add another dozen or so firms for reasons of economy, but "expansion beyond that would destroy the present intimacy between the firms themselves, and between them and the London office," reports the *Financial Times*. Most of the members are private firms; many are family businesses. They appreciate the value of a small organization, and have similar problems.

• **Discussion Groups**—The MRG is divided into seven regional groups, which means an average of about 11 members to the group. Each group, under an annual chairman, meets regularly in the winter months. Participants are mostly the top men from the member firms.

"With lunch or dinner as a lubricant," commented the *Financial Times*, "a general discussion follows a fairly short talk by a visiting expert." Recent topics include fringe benefits, shop stewards, public relations, recruiting graduates.

The discussions are not aimed at producing agreement, as a recent meeting in Manchester proved. The guest speaker, talking on the chairman's role in business, strongly deprecated the tendency to combine the chairmanship and managing directorship in a single person. The discussion was enlivened by two men who were combined chairmen-directors (they pleaded self-defense, citing the difficulty of obtaining good replacements).

• **Central Staff**—A small London office acts as a clearing house, "transmitting information and putting X in touch with Y, who may be able to help," reports the *Financial Times*. Plant visits are also arranged, and the members report they learn a surprising amount about management techniques from firms in different businesses.

At the request of members, the MRG conducts informal surveys on such things as work study, "top hat" pension schemes, even how often company cars should be replaced. A monthly bulletin is the main line of communication.

Membership fee is based on size, with a minimum of £40 ($112) a year for companies with under 100 employees. The MRG was founded in 1925, and comments the *Financial Times*, it "must rank by any standards as a pioneer of the art of management in Great Britain." ●

Distant Executives Get Better Results

WHAT MAKES a good executive? It varies somewhat with the country, no doubt. But a six-year study of U. S. management offers this model:

The most effective executive is psychologically distant from his key subordinates and does not get emotionally involved with them; he is able to judge his subordinates objectively. But he must not be so distant that subordinates rebel against his authority.

This study was carried out by researchers fom the University of Illinois' Group Effectiveness Laboratory who studied the interpersonal relationships in groups ranging from basketball teams to open-hearth furnace crews. Successful executives were not as well liked as were more outgoing bosses, and sometimes their subordinates liked their jobs less. But the distant managers got better results.

The final study, which investigated management effectiveness in 32 similar consumer cooperative organizations, found that the success of the organization did not seem to be affected by the extent of agreement on policy or objectives among the directors and executives. ●

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Take a Critical Look

at the design of your Gear Shaving Machines

In today's competitive economy, it is imperative to scrutinize each production machine from the standpoint of operating costs. Just what does it contribute? What does it cost to operate? How does its design affect its operating economy? These questions suggest other more specific questions in the case of gear shaving machines:

CHIPS

- Are the cutters of your machines so located that chips fall away from them rather than into them?

LOADING HAZARD

- If, while loading, a work gear accidentally slips from the operator's fingers will it fall into the cutter teeth?

GRAVITY

- Is cutting pressure applied downward, taking advantage of gravity or upward, unpredictably taking up the operating clearance of the table ways?

AUTOMATION

- Are the extra components needed to automate the machine, in the way when the cutter is changed?

RIGIDITY

- Does the single solid cast column provide more rigidity than one made up of bolted sections?
- Is a deep massive table assembly held in position by gravity more rigid than a shallower, lighter assembly hung from above?

OBSTACLES

- Are there any projections above table level to interfere with the operator's movements as he loads a work piece or changes the cutter?

FEED

- Is the automatic feed mechanically positive and consistently precise?

To check your answers to these pertinent questions, call your Red Ring representative and suggest he bring along Bulletins AP 57-11 and S-57-2—All in the interest of ECONOMY.

SPUR AND HELICAL GEAR SPECIALISTS
ORIGINATORS OF ROTARY SHAVING,
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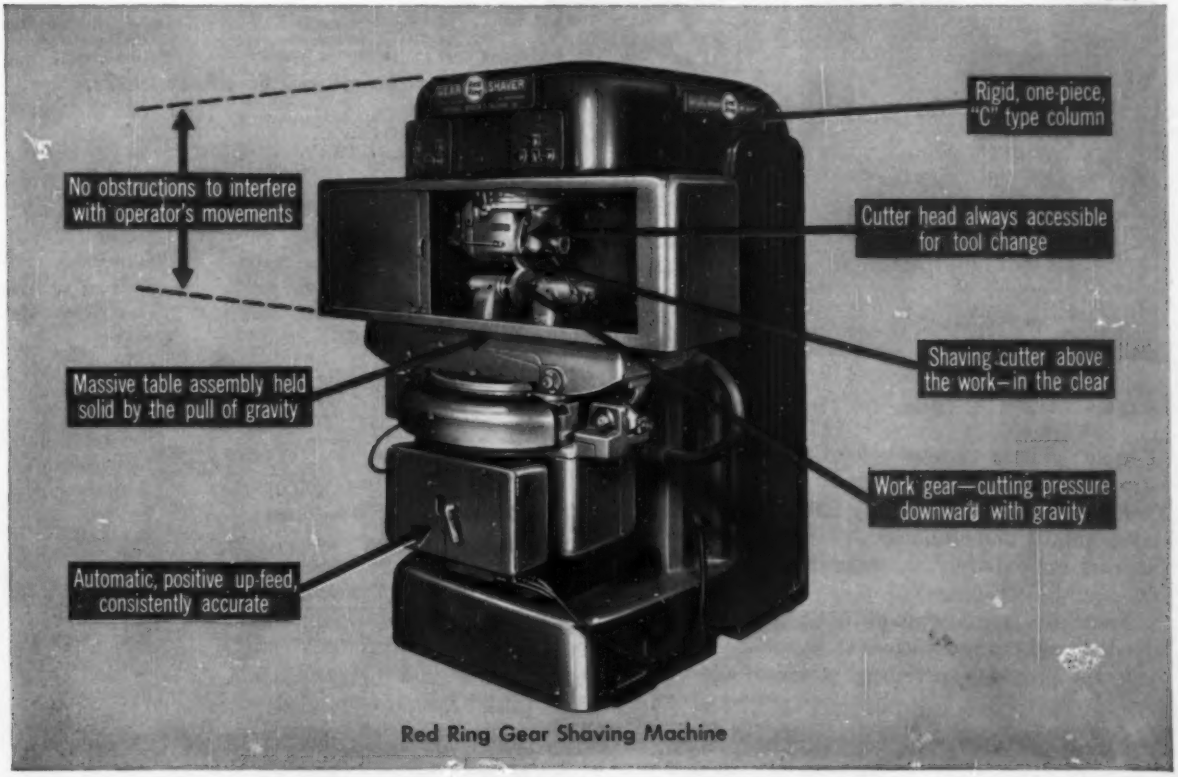
No obstructions to interfere with operator's movements
Massive table assembly held solid by the pull of gravity
Automatic, positive up-feed, consistently accurate
Rigid, one-piece, "C" type column
Cutter head always accessible for tool change
Shaving cutter above the work—in the clear
Work gear—cutting pressure downward with gravity

Red Ring Gear Shaving Machine

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- Arnel Triacetate (filament, staple, spun)
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- High Tenacity Rayon
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- Cellulose Acetate

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- Aldehydes
- Lactones
- Polyols
- Vinyl Monomers
- Acrylates
- Alcohols
- Esters
- Glycols
- Ketones
- Plasticizers
- Functional Fluids

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- Cast Acetate Film and Sheet
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- Cellulose Acetate Molding Compounds
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- Low Pressure Polyethylene Molding Materials
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Acetate ... One of the family of Amcel fibers

For an endless variety of textile applications, the fiber to use is *Amcel Acetate.*

Amcel Acetate, the beauty fiber, offers the advantages of quality, adaptability, and economy. It is the first choice fashion fiber for men, women and children . . . decorative fabrics . . . undergarments . . . fillers and interlinings.

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INTERNATIONAL MANAGEMENT'S

Recommended Reading

Keep Spies from "Cracking" Your Firm

Competitive Intelligence: Information, Espionage and Decision-Making, by B. H. Alden, B. C. Campbell, et al., reveals how some companies gather trade secrets from rivals. Based on a study made by several graduates of the Harvard Business School, this book recommends a program for establishing effective corporate intelligence systems to combat espionage in industry. 78 pages, $10 (C. I. Associates, 25 George St., Watertown, Mass., U.S.A.)

Bulletins from Industry

"New Color Horizons," a 38-page Rust-Oleum catalog, provides detailed information on new developments in protective coatings for rust and corrosion control. Contains 76 full-color application photos and 110 color chips. (Rust-Oleum Corp., 2799 Oakton St., Evanston, Ill., U.S.A.) . . . The Friden "Collectadata" manual illustrates and explains operation of machines used to collect data from several points of origin to a central processing point. (Friden, Inc., 1 Leighton Ave., Rochester, N. Y., U.S.A.).

Vive la Qualite!

Qualité France (a non-profit French association that establishes quality standards for French products) now has available its new 80-page directory. Entitled Catalogue des Produits Agréés, 1959, it alphabetically lists about 600 products that meet with the Association's specifications. 83 pages. 100 fr. in stamps. (Qualité France, 18 rue Volney, Paris 2, France).

A Symposium on Employee Incentives

Successful Suggestion Schemes, issued by London's Industrial Welfare Society, outlines popular practices in employee suggestion systems, with analyses and illustrative tables showing progress of these plans in large and small British firms. Cases cited can be applied to companies throughout the world. 44 pages. 4s 6d. (Industrial Welfare Society, 48 Bryanston Sq., London W.1, England). An American publication of this type is Suggestion Systems—Factors that Lead Towards a Successful System and Why Others Fail. 55 pages, $1.50 (National Industrial Conference Board, Inc., 460 Park Avenue, New York, N. Y., U.S.A.). . . . Employee Incentive Plans, by a businessman, Daniel R. Pohlman, compares individual incentive schemes with group incentive plans (e.g. profit-sharing, sales-sharing—IMD, Nov. p. 48) indicating advantages and disadvantages of each. Free copies are available upon request. (The Eddy-Rucker-Nickels Co., Harvard Square, Cambridge, Mass., U.S.A.)

World Trade

Tariffs and Trade in Western Europe, new book by Political & Economic Planning—a private British research organization—gives a timely analysis of the western European tariff picture. It presents a study of the joint tariffs being decided by Euromart countries, as well as a detailed comparison of the tariffs of Europe's 12 major industrial countries. 30s. (George Allen and Unwin, Ltd., 40 Museum St., London, WC 1, England).

INTERNATIONAL
MANAGEMENT'S

Personal Business

Pastimes: To Each His Own

Topsy-Turvy Bridge: Do you get all the low cards in bridge? If so, insist on "antibridge"—a new game some of the jaded connoisseurs are playing.

You can win by making negative bids. A bid of "minus four hearts", for instance, means that you intend to take no more than three tricks, forcing your opponents to make the equivalent of a four-heart contract. This is possible because a minus bid ranks higher than a positive bid in the same suit; "minus" hearts are higher than hearts, lower than spades. A negative contract, incidentally, is played by declarer's partner.

Tips on bidding: Bid minus one no-trump if you have even distribution with no more than six points in high cards (aces 4, kings 3, etc.). Also try this curious convention: Bid one-minus in a suit to indicate an opening positive hand with only one card or a void in that suit.

"The World's Best Fishing": If the thought of catching 500-kg black marlin stirs your sportsman's blood, you will want to know more about the Cabo Blanco Fishing Club on the coast of Northern Peru. Within a few kilometers of the beach you have a chance of landing any of the main Pacific game fish. Sportsmen catch black marlin, broadbill swordfish, and big-eyed tuna year-round; striped marlin and Pacific sailfish are most numerous from October through June. Details from Cabo Blanco Fishing Club, Casilla 89, Talara, Peru.

Music by Numbers: You either like or detest electric organ music, but there are many music lovers who are buying portable electric chord organs these days. Still a comparative novelty, these are essentially small electric accordions on legs, with an electric fan instead of a squeeze box.

They are absurdly easy to play: You pick out a melody with one finger and a full harmonic accompaniment with another. The 20-odd black and white keys are played with the right hand. The bass issues from a tier of 12 to 60 chord buttons, played individually with one finger of the left hand. Musical scores have numbers and letters corresponding to the notes and chord buttons on the organ. U.S. prices run from $80 to about $300.

The Family Goes Karting: A new sport, karting, is working its way across the U.S. from California, and has spread to many other countries. Karts (picture) sell anywhere from $40 (for an unassembled kit without engine) to $600 (for an upholstered, two-engined kart). Welcome feature is their safety: Karts are so low it's almost impossible to turn them over. Children scoot along at 16 km/hr in non-racing models, while parents and teenagers drape their legs around the wheel and race in the 56-112 km/hr types. The producers have organized into the American Kart Manufacturers Assn., 5959 Hollywood Blvd., Los Angeles 28. You can get a 75¢ booklet, "Let's Go Karting", at this address.

Caterpillar Diesel D7 Tractor equipped with No. 7A Bulldozer carves firebreak to halt forest fire. Manufactured by Caterpillar Tractor Co., Peoria, Ill. Uses Bundyweld for fuel and oil lines.

Firefighting bulldozer of the forest relies on lifelines of Bundy Tubing

RUGGED, multipurpose equipment like the tractor and bulldozer shown here naturally demands extra-sturdy, extra-dependable tubing. That's why leading manufacturers specify Bundyweld Steel Tubing "lifelines" for oil, fuel, brake, and hydraulic systems.

The accepted safety standard of the automotive and refrigeration industries, Bundyweld is used *in 95% of today's cars, in an average of 20 applications each!*

Industrial designers the world over know that Bundy backs up its ultrareliable tubing with specialized engineering assistance. New uses are found constantly – in both fluid transmissions and purely mechanical applications involving strength, flexibility, and low cost. Write today, or cable BUNDYTUBE for information.

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Bundyweld starts as a single strip of copper-coated steel. Then it's . . .

continuously rolled twice around laterally into a tube of uniform thickness,

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Bundyweld, double-walled and brazed through 360° of wall contact.

BUNDYWELD® TUBING

DOUBLE-WALLED FROM A SINGLE STRIP

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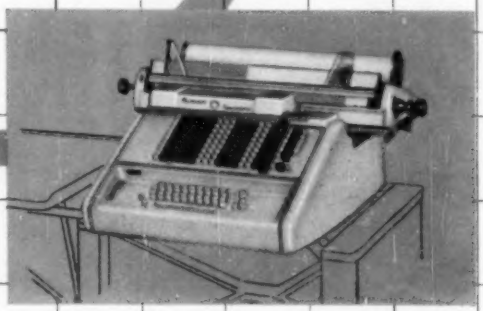
- Leakproof
- High thermal conductivity
- High bursting point
- High endurance limit
- Extra-strong
- Ductile
- Lightweight
- Machines easily
- Takes plastic coating
- Takes plating
- Shock-resistant
- No inside bead
- Uniform I.D., O.D.

E101 Electronic Computer



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When you select a new Burroughs adding, accounting or computing machine, you make an investment which pays off immediately and *continues to pay off* in increased profits through many years of dependable service. Why? Because the multi-job versatility and many advanced efficiency features built into all Burroughs machines allow a growing business to handle its increasing flow of paperwork with speed, ease and accuracy.

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The Burroughs representative in your locality is always available to work with you and your accountant in selecting the best system to meet your particular needs. For his address, consult your directory or write: Burroughs Corporation, International Division, Detroit 32, Michigan, U.S.A.